Innovation and Change Management in Public and Private Organizations: Case Studies and Options for EPA

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EPA MESSAGE

Innovation is about testing new ideas, assessing their effectiveness, and mainstreaming those that prove useful in helping an organization achieve its goals. In an attempt to learn how other organizations have promoted innovation and instituted systems for sustaining the innovation cycle, EPA asked the RAND Corporation to survey six public and private sector organizations that have used innovation to advance their goals. We believe the RAND case studies of three Federal Agencies — the Food and Drug Administration, the Veterans Health Administration, and the U.S. Customs Service — and three businesses — Proctor & Gamble, Dupont, and Marriott — offer some valuable “take-away” lessons that can assist our ongoing innovation efforts at EPA.

It is encouraging to note that some of the hallmarks of other innovative organizations are already well underway in EPA — using information to strategically improve program design, targeting limited resources to priority problems, and creating partnerships with other organizations that share similar. However, there are areas where we can do more to promote and support innovation across the Agency. The RAND adaptation of the “balanced scorecard” approach and “change management” model offer some interesting insights into how we can advance innovation more fully at EPA.

In each case study, RAND found that organizations that have sustained innovation have senior leaders who establish a clear and compelling vision, create alignment of the entire organization around that vision, and personally lead organizational change. They also establish an environment in which creativity and innovation can flourish, and they institutionalize good ideas. In recent years, EPA has demonstrated strong management support for innovation through its cross-Agency Innovation Action Council, a comprehensive Innovation Strategy, a newly established National Center for Environmental Innovation, and numerous high-profile innovation initiatives. With these experiences and support mechanisms in place, EPA must now focus on building an organizational culture and set of management systems that enables innovation to flourish at all levels of the Agency.

We welcome your response to the ideas put forth in this report, and hope it can help propel EPA forward in its pursuit of innovative approaches for improving environmental results.

Jay Benforado  
Director,  
National Center for Environmental Innovation
INTRODUCTION

Over the last decade, the Environmental Protection Agency (EPA) and its state counterparts have launched dozens of initiatives aimed at finding better ways to implement and enforce environmental laws (U.S. Environmental Protection Agency, 2000a; U.S. Environmental Protection Agency, 2000b; U.S. Environmental Protection Agency, 2001). These programs have produced a wealth of experience and insight, but also sometimes strained existing program funds; stretched agency personnel who often had other full-time, statute-driven responsibilities; and produced a range of environmental results.

Two years ago, at the request of Congress, the National Academy of Public Administration (NAPA) undertook a comprehensive study of many of these innovation initiatives and made recommendations to the Administrator, Congress, states, and others on what should be done next (National Academy of Public Administration, 2000). Specifically, NAPA recommended that the Administrator: (1) Tackle the big environmental problems; (2) Invest in information and assessment; (3) Hold states accountable for results; and (4) Use all of the tools available to change management cultures and practices to focus on achieving critical environmental goals. Many additional recommendations were included under these broad categories. Numerous other studies and groups have made similar recommendations. This study offers some insight into NAPA’s fourth category of recommendations.

This study had three purposes. First, the study was designed to illuminate characteristics of a selected set of public and private organizations considered innovative. A second purpose, distinct from the first, was to look specifically at how each of the organizations managed change to enable and sustain innovation. This is particularly important to EPA because internal and external reviews have consistently identified the agency’s difficulty in moving successful experiments into system-wide use (National Academy of Public Administration, 1997).

RAND was also asked to assess the implications of the findings for EPA and suggest preliminary options for implementing change management at the agency. As a regulatory agency, EPA operates under legal constraints that make certain aspects of its core mission less amenable to innovation in the near term than other areas. In considering options for implementation, RAND primarily focused on areas that EPA staff suggested were ripe for consideration.

At the time this study was initiated, EPA had just released a draft Innovation Strategy to provide staff and EPA’s many external partners and stakeholders with a proposed blueprint of change in the agency over the coming years. “Innovating for Better Environmental Results: A Strategy to Guide the Next Generation of Innovation at EPA (the Innovation Strategy) was released (U.S. Environmental Protection Agency, 2002).
This study is intended to supplement and support the element of the Innovation Strategy dealing with a “system for systems change,” which refers to the structures and processes required to initiate, implement, support, and sustain innovation throughout the agency.

The term “innovation” encompasses changes in organization culture, outputs, and business processes that collectively make an organization more effective and successful in fulfilling its core mission. Innovation is a continuum of processes to generate, test, and implement new ideas. An organization should have compelling business reasons to innovate; innovation is not an end in itself. Indeed, as some of our case studies illustrate, because of changes in the external environment (for example, changing customer needs, newly available technologies, different priorities as determined through the policy process), organizations had compelling business reasons to adjust both their mission as well as their organizational processes. As applied to EPA, innovation could range from incremental changes in current regulatory practices to an entirely different model of regulation.

We have found that in addition to a culture that embraces problem-solving, organizations that successfully support and sustain innovation over time have established “systems of innovation”; these are business structures and practices to move new ideas through successive phases of planning, experimentation, evaluation, and if appropriate, full-scale implementation. While the notion of institutionalizing innovation sounds like an oxymoron, the fact is that aligning business support systems and core processes to stimulate and support innovation over the long haul is a consistent and time-tested ingredient of success in the cases studied.
RESEARCH METHOD

RAND selected six public and private organizations for study. The case material is based on available literature and personal interviews with current and former employees of these organizations. (Any errors in interpretation, however, are the authors’)

The research strategy, shown as five steps in the above slide, was designed to ensure that the findings from the case studies would be relevant to EPA’s core functions as well as its agency-wide strategic planning. In the first step, the models of innovative organizations and change management guided questions we asked in interviews, helped screen out information that was less relevant, and provided the analytical basis for considering implementation options. Considerable effort was expended on the criteria and process of case study selection in the second step. We looked for similarities to EPA in processes and functions, as well as similarities in more general attributes like organizational structure, external stakeholders, and leadership change.

In the next steps, we synthesized findings from the case study interviews and literature review. Findings from the individual cases and across the cases are organized according to the two models. First, we looked at the specific characteristics that make these organizations innovative. Second, we focused on their system of change management, which includes specific actions taken to prepare, execute, and support innovation. Finally, we synthesized all the findings in the form of options for EPA to consider as it moves forward on implementing its innovation strategy. It is important to note that because we did not study current EPA programs, our presentation of options are based on what has been successful at other organizations.

The following slides provide further detail on our approach.

We began the case study analysis by utilizing a framework in which to gather and analyze information. We adapted the well-accepted Balanced Scorecard approach to reflect the core elements, connections, and actions of innovative organizations. The Balanced Scorecard is a structured process to evaluate the effectiveness of actions within four primary domains that contribute to meeting the strategic goals of an organization. It represents a fundamental shift in management thinking from control and compliance (rules-governed) to a performance accountability system (mission-driven) (Rohm, 2002). (As described later, Marriott also adopted the Balanced Scorecard approach.)

Research Method

- Identify models of innovative organizations and change management
  - Connect models to EPA structure and function
- Screen and select case studies
  - Use attributes relevant to EPA
- Analyze case studies in context of models
- Summarize findings across cases
- Consider options for EPA
In the context of this study, we use the Scorecard as a map of organizational performance. It also provides a structure to translate the case study findings into actionable items for implementation within EPA. An advantage to using the Scorecard is the existence of a community of practitioners available to help with implementation (Camm et al., 2001).

The chart shows an integrated system of activities that covers four primary domains, each emanating from the organization’s mission and strategy. For our case studies, we selected organizations that promote innovation as one of their core strategies. Following the structure of the Scorecard, we thus identified the actions within each of these domains that contributed to innovation.

Note that this construct explicitly recognizes that organizations operate in a dynamic external environment. An innovative organization exploits knowledge and information from all sources, internally and externally. For the EPA this would include changes in citizen priorities, industry practices, Congressional guidance, Federal and state policy, and technology.

Other parties and stakeholders, including states and Native American tribes. This domain includes activities to gather information on preferences, interests and satisfaction of other parties; measure performance in meeting their needs; and develop consensus for action where necessary. In the private sector, lead customers are frequently involved in experimentation. We have modified this category (and shaded the box on the chart) to emphasize that states and tribes would be the dominant element of EPA’s external relationships.

Employees and organizational capacity. This domain includes activities to ensure proper training and skills development, and create a multi-functional, problem-solving culture that excels at incorporating knowledge from external and internal sources. Innovative organizations often offer career rewards to innovators and seek senior managers and other leaders who are open to change.

Core and supporting business processes. Innovative organizations have formal, structured processes for generating ideas, testing the ideas, and implementing those that are likely to contribute to mission success. They also have ways of sharing information (e.g., networks) and aligning innovations to strategy (e.g., priorities, goals, plans).

Budget and finance. Budgeting and financial arrangements provide the resources to support innovation in all phases – from experimentation to full implementation. In the public sector, the annual budget offers the most reliable process of expressing organizational priorities.

Understanding the core functions of the EPA is crucial to understanding how the findings from the case studies may be relevant to the agency. However, RAND did not conduct a study of current EPA programs to identify opportunities for innovation. As an extension of the current study, the processes supporting the functions could be mapped to show actions and decisions in time and at various organizational levels. This mapping exercise would lend insight into the ways in which the case study findings may have relevance to EPA’s particular circumstances.
We were also interested in capturing the process of managing change in organizations striving to become more innovative or who already are. Hence, we needed a more dynamic representation of change management distinct from the “current state” representation of an innovation organization shown on page 6. The model shown above applies to an initial transformation as well as subsequent change and scale-up of experiments and prototypes, with the difference being in the scale and scope of the effort required (Moore et al., 2002).

Managing change or a “system of innovation” refers to three sets of integrated actions: prepare for change, support change, and execute change. Regardless of the scale of the change desired, these elements must be present for successful implementation. Organizations that have successfully sustained innovation addressed all three of these action areas.

_Preparing for change_ “includes making a case by articulating the pressure and urgency for change; generating senior leadership support for change and putting in place a guiding coalition of key stakeholders to oversee the change; developing a short- and long-range vision of the future after the change and outlining an action plan for how to move to the future vision (Moore, et al., 2002).” An action plan identifies measures of success; organizational, compensatory, personnel and other barriers (including anticipated resistance) to full implementation of any major change; those responsible for overcoming the barriers; and measures to track progress and to ensure accountability for achieving success (Moore et al. 2002).

_Supporting change_ “includes sustaining multilateral communications about the need for and progress of change; providing training and skills both to make the change and to perform the new tasks required; incentives for personnel to make and sustain the change; and resources to make the transition (Moore, et al., 2002).”

These actions collectively create a climate for innovation, revolving around an organization’s culture: a consistent and clear signal of openness to new ideas, problem solving capacity, inclination to learn from missteps, and appreciation for those who challenge the status quo. An individual’s capability to innovate is directly tied to incentives. Raises and bonuses are not necessarily the primary motivators, but rather agency-wide or public recognition, more rewarding work, and greater autonomy.

A recurring theme in the public sector is the frequent disconnection between management entreaties to innovate and out-of-date human resources practices that either work against or simply fail to align with innovation. Other important contributors to an individual’s capability to innovate include a rich understanding of the enterprise (including the core mission and stakeholder interests), the availability of resources to develop new ideas, and new skills training opportunities.

_Executing change_ “includes initial tests and evaluations of pilot studies all the way toward full deployment and continual monitoring and refinement to incorporate learnings during implementation” (Moore, et al., 2002).

Relevant processes and structures may include an innovation leadership team, special planning and budget processes to fund innovative ideas at various stages of development or implementation, or structured project review and management processes. Without such practices, individuals have no place to take new ideas for...
further development or implementation and eventually, new ideas will no longer be offered, and the system will shut down.

Each case study described in later text presents a set of activities that constitute the system of innovation within the organization. Other examples from the business literature will be introduced as appropriate.

To identify potential candidates, we consulted with colleagues at RAND and elsewhere on potentially relevant cases and conducted a systematic, reconnaissance-level literature survey of organizational management and other literature. In consultation with the EPA Office of Policy, Economics and Innovation (OPEI) staff, we ultimately selected six cases for study based on the information at hand and our assessment of how closely the candidate organization aligned with the screening criteria. Our working assumption in the case study selection process was that no example would likely have all the attributes relevant to EPA. Therefore, multiple examples would be used to illustrate different attributes or combinations of attributes. The following attributes guided our case selection:

- **Relevancy of change/innovation process**: We looked for organizations that excelled in generating, screening, disseminating and implementing new ideas to improve organizational performance. These would be the key processes to institutionalize at EPA in some systematic way. To identify such organizations, we relied largely on subjective judgment and reputation in the absence of more precise measurements of this quality.

- **Sustainability**: We looked for organizations that had managed to sustain a culture of innovation for five or more years. “Proven” or “successful” processes were sought for which information on implementation is available. Examples of near-misses and other variations of failure over longer periods of time were also of interest.

- **Organizational complexity**: We looked for organizations with similarities to EPA’s multi-layered structure, multi-functional mission, decentralized organization, and complex partnerships. EPA has multiple organizational levels (headquarters, regional, laboratories); seeking different objectives (science, policy, rule making, enforcement, education); working in close partnership with states, tribes, industry and others; and requiring a mix of skills.

- **Multiple stakeholders with diverse and divergent interests**: Most complex public and private sector organizations function in an environment with multiple, diverse stakeholders. In the case of EPA, the diversity extends to Congress, non-governmental organizations, state and local government, industry of many types, and the public at large.

- **Asymmetry of success and failure**: Consequences of failure may exceed uncertain rewards of incremental success from innovation. EPA and other public organizations, particularly regulatory entities, function in this asymmetrical world. The public expectation is that regulators first do no harm, with no particular expectation of optimizing use of public resources. Stability, certainty, and good enough performance are highly valued by the public and the regulated community. Commercial analogs to asymmetry in the public sector would be...
firms that require high consumer confidence (e.g., pharmaceuticals); high reliability or performance with severe consequences of failure (e.g., aircraft manufacturing, electricity generation/transmission); or an exemplary public image (e.g., family entertainment).

**Regulatory function:** We looked for organizations that had similar adversarial relations with partners in parallel with cooperative activity. Other public organizations have managed to varying degrees to be innovative in the face of legal constraints on operations.

Predictable change in leadership: Given the long time frame to plan, implement, and sustain organizational change, we looked for other organizations that have managed to perpetuate an environment of innovation and learning, even as top leadership has changed.

After multiple iterations, we settled on three federal agencies that had undergone substantial change in the 1990s and that appear to be successfully sustaining those changes—the Food and Drug Administration, U.S. Customs Service, and the Veterans Health Administration. We placed significant weight on the existence of some regulatory development, compliance, and enforcement functions comparable to EPA’s functions. In the chart above, a single dot indicates possession of the attribute; a double dot indicates a particularly strong example.

While the management literature is replete with examples of change in customer-driven public and private sector organizations, far less work has been done specifically in the area of organizational change in regulatory agencies. Clearly, the FDA comes closest to matching EPA in our screening attributes. The VHA and Customs Service have somewhat less complex stakeholder relationships, although no less challenging and at times contentious.

The Veterans Health Administration (VHA) is a federally funded and centrally administered health care system for veterans. Congress has directed the VHA to provide patient care, research, teaching, and backup health services for the Department of Defense. It is one of the largest health care services providers in the U.S., employs 180,000 and includes 172 hospitals, 132 nursing homes, 73 home health care programs, 40 residential care programs, and over 600 outpatient clinics.

The Food & Drug Administration (FDA) is one of this country’s oldest consumer protection agencies. It employs 9,000 people to monitor the manufacture, import, transport, storage, and sale of nearly $1 trillion worth of products a year. FDA considers itself, above all, to be a public health agency, charged with protecting consumers by enforcing the Federal Food, Drug, and Cosmetic Act along with several other public health laws. About 1,100 investigators and inspectors, located in 157 cities, keep track of 95,000 FDA-regulated businesses. In addition, 2,100 scientists work in 40 laboratories around the country to analyze samples collected by investigators and inspectors. They determine if products are contaminated with illegal substances and review results of companies trying to receive approval for drugs, food additives, and medical devices.

The U.S. Customs Service, currently within the U.S. Department of the Treasury, was established by the first Congress in 1789 to collect tariffs and stave off impending bankruptcy of the new government. It now has 19,500 employees, more than 300 ports of entry, annual revenue collections of $22.1 billion, and an annual
budget of $3.1 billion. Called America’s Frontline, Customs has emerged as the key enforcement agency responsible for protecting national borders, monitoring imports and exports, collecting tariffs, interdicting illegal drugs, and disrupting money laundering operations. In the newly proposed Department of Homeland Security, Customs would be one of its most significant components in terms of number of employees, budget, and core functions.

On the private sector side, the mix of case studies includes sizable, mature companies because they had the most similar attributes to EPA. Marriott International, DuPont and Procter and Gamble all have multiple organizational levels, are multifunctional, and are often beset by some degree of organizational inertia. As in the previous slide, a single dot indicates possession of the attribute; a double dot indicates a particularly strong example.

Marriott International is a hotel management services company, with lodging, distribution services and senior living businesses. Marriott International operates and franchises about 2,400 properties in 65 countries and territories, 47 timeshare resorts, 155 senior living communities, 26 golf courses, and 19 hotel reservation centers. Its Distribution Services group distributes food and related items to 7,000 customers, through 13 distribution centers. In 2001, Marriott had 140,500 employees and sales of $20 billion. An industry leader based on customer surveys for several years, it has built a reputation for service innovation and quality delivery. Marriott has a long history of modifying its product lines (beginning as a root beer stand) to segmented hotel chains, as well as its corporate structure, through divesture and alliances. Management of innovations within Marriott’s franchised operations share some similarities with EPA’s partnerships with the states and permitting activities.

Procter and Gamble (P&G) is a $40 billion company which develops, distributes, and markets fabric and home care, baby care, feminine care, beauty care, health care, and food and beverage products. P&G sells over 250 brands to more than 5 billion consumers in 140 countries. The company has 106,000 employees in over 80 countries. P&G recognizes that to sustain growth, the organization must make it easy for innovation to flow across the enterprise; facilitate rapid learning about customer preferences; and enable commercialization of profitable ideas.

DuPont began 200 years ago as a small, family firm and has now grown into a global chemical products and services enterprise operating in 70 countries around the world. From a manufacturer of one main product – black powder for guns and blasting – DuPont is now a $24.7 billion supplier of innovative materials, services, and technologies. DuPont has implemented a highly structured and multifaceted approach to culture change and changes in internal business processes to spur innovation and more rapidly connect research to product development and marketing.

In looking for relevant private sector cases, we initially focused on service-oriented enterprises that worked in ways similar to EPA, like banking and insurance firms. However, none presented a sufficiently compelling model of innovation as well as easy access through interviews and literature review.
The case study analysis proceeded in two phases. In the first phase, we examined the relevance to EPA of the organization’s transformation, the underlying causes of change, the features that make the organization innovative, and the activities employed in transforming the organization.

In the second phase, we analyzed common themes across the cases, distinguishing between themes related to the “current state” of the innovative organization and themes related to the “system” of managing change and innovation. Themes are further ordered by their relation to the components of the two models presented earlier in this section.

To the extent possible, we identified timelines for innovation-related actions; barriers and supports to change; human, budgetary, and other resources utilized; and key enabling actions that facilitated the change process within the organization. We also examined control factors; evaluation methods and measures; dissemination of findings; and integration into practices, staffing, training, and budget. One important area particularly relevant to EPA was how much latitude experiments and change processes had to “break the rules.”
FINDINGS OF CASE STUDIES

Summaries of the six organizations studied are presented in the following pages. The material presented here was derived from interviews with current and former employees familiar with their organization’s transformation efforts as well as pertinent secondary literature and congressional testimony. The complete and more detailed case notes appear in the appendices.

Note that while case studies give a rich understanding of how organizations respond to external and internal change, they are by necessity only a snapshot in time of the organization, its structure and associated processes. In some cases, organizations have been in some state of transformation for ten or more years, while others initiated change about five years ago and their long-term sustainability remains uncertain.

Relevance to EPA
The FDA case focuses on implementation of the new drug review process which has relevance to review processes mandated by the Toxic Substances Control Act (TSCA) and Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). More broadly, the case describes the steps taken by the FDA to manage high-profile technical review processes that require balancing risks and benefits in the context of competing public and private interests.

Causes of Change
By the early-1990s, the FDA was being criticized by industry and some stakeholders for its lengthy new drug review times. The FDA and others anticipated that new drug applications would rise as a consequence of significant investments made by the National Institutes of Health and the private sector. The disconnect between FDA resources (particularly the number of review staff) and the anticipated rise in new drug applications, was compounded by the fact that Congress was unlikely to increase the FDA’s appropriations to handle the heavier load.

Innovations
The FDA Commissioner David Kessler sought legislative change which eventually resulted in the Prescription Drug User Fee Act (PDUFA) of 1992. A key element of PDUFA implementation was the more explicit understanding that the FDA review was to balance drug safety with earlier beneficial access to drugs. The legislation also mandated significant changes in funding and performance goals for the review of new drug applications. In exchange for user fees to pay for new staff to handle expedited reviews, the FDA agreed to performance goals for review times.
The new focus on quality and timeliness led to subsequent innovations:

- The review organization was restructured, increasing the number of review offices and divisions to eliminate potential bottlenecks. This change had the added benefit of creating new positions to promote top performers. The review process became more standardized and consistent because of the larger number of offices and divisions; prior to PDUFA, each unit had its own process.

- New drug applications are now stratified into two priority classes. For standard new drug applications FDA agreed to “review and act on” such applications within 12 months from the date of submission. (Standard new drug applications were taking 24 months for approval at the time of PDUFA was enacted.) For priority new drug applications, such as those intended for use against “serious and life-threatening illnesses” like cancer, HIV/AIDS, and Alzheimer’s disease, the “review and act on” period was 6 months.

- Project management and teaming concepts were introduced. Information sharing among the disciplines across divisions improved, which also helped with the integration of new hires. A joint agency-industry working group was established: to oversee efforts to improve review times; implement a project management system; implement a performance tracking and monthly monitoring system; and develop and pilot a computer-assisted application program.

- Application requirements and guidelines were published on the web, which improved process transparency with industry and others.

**Change Management**

PDUFA implementation required major cultural change within the FDA. Prior to PDUFA, interactions between FDA review staff and industry were typically infrequent and adversarial; most FDA staff viewed this kind of relationship as essential to maintain independence and objectivity. The new, more transparent process requires a more cooperative interaction with industry, for example, to ensure that clinical trials are designed to provide the information needed for a high quality review and reduce risks to participants. Industry’s behavior changed as well. Under PDUFA implementation, applications had to be complete when submitted; otherwise, the clock on review time was restarted. Project management and teaming concepts also required a change in culture.

PDUFA implementation is considered a success by most observers. The original legislation has been reauthorized twice since 1992 and performance goals have been met consistently. The case also exemplifies how innovations occur when a new performance measure is introduced – i.e., what gets measured, gets managed.

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**VHA: Key Findings**

- **Innovations**
  - Established Veterans Integrated Service Networks
  - Pushed decision-making closer to service delivery
  - Focused on accountability and performance
  - Aligned budget with service delivery and performance
  - Restructured R&D to support clarified mission

- **Change Management**
  - Clarified mission, as articulated by visionary leader
  - Built compelling business case for change
  - Obtained changes in law and rules to support mission
  - Communicated compelling vision, mission, and goals to Congress, staff, and stakeholders
  - Selected senior managers supportive of change
  - Used organizational change to spur experimentation

**Relevance to EPA**

The VHA is an example of major organizational transformation. The case is rich in detail on how to align organizational structures and allocate resources to achieve primary objectives, and how to change the locus of decision-making to ensure effective solutions are applied when local conditions vary. Lessons from the VHA could help the EPA rethink its business model in broad terms and how headquarters might interact with programs, states or regions. The case also provides interesting insights into how an agency seeks legislative change.
Causes of Change

The VHA faced external threats to its existence. Young, in his monograph on revitalization of the agency, identified four such threats (Young, 2000). First, although the site of health care in the country was shifting to the outpatient clinic and away from the hospital, the VHA in the early 1990s consisted primarily of an inpatient, hospital-based system. It was thus out of sync with the times. Second, and as a partial consequence of the shift to the outpatient setting, the prospect existed that VHA would lose ground to competition from the private health care sector. Third, VHA faced the threat of a Congressional freeze on its appropriations. Finally, demographic change in the veterans’ population had resulted in an older and sicker VHA patient than was true for health care in general, creating serious challenges to the type of care provided.

Innovations

The VHA refocused its de facto mission from running hospitals for veterans to providing healthcare to veterans. This seemingly modest change was critically important to the way the VHA was subsequently reorganized and managed. Ken Kizer, the Undersecretary of Veterans Affairs and Director of the VHA at the time, led the transformation.

- Kizer restructured the VHA in his first year. He created 22 regional entities called Veterans Integrated Service Networks (VISNs) (Kizer, 2000). These networks became the operating basis of the organization. In taking this step, he decentralized a highly centralized, rule-oriented VHA bureaucracy that functioned by top-down, central office control of veterans’ hospitals. Because local exceptions to rules were routinely found, this shifted the locus of control upward from the local VHA hospital to the region. Budgeting, planning, and operational authorities were transferred to the VISNs from the central office.

- Kizer introduced an accountability system built around performance contracts for VISN directors (Kizer et al., 2000). The accountability system served to align the performance objectives of network directors with the strategic objectives of VHA. The emphasis on accountability also served the symbolic function of reinforcing throughout VHA the concern of the central office for improving institutional performance. VISN directors had the flexibility to make decisions and to find local solutions to provide quality healthcare to veterans in their region. It should be noted that performance measures were met with skepticism and complaints over data quality. When data were not available, or good, Kizer had the research organization collect data to support decision-making. He took performance measures seriously: when the data showed services did not meet national standards, he closed them even in the face of opposition by the VISN directors.

- The budget allocation process was also revamped to align resources with services provided. The Veterans Equitable Resource Allocation (VERA) process objectives included: a change in resource allocation over time in response to changing geographic distribution of veterans; reflection of geographic differences in the costs of care and the health care needs of veterans; and periodic refinement of the system based on careful monitoring (Wasserman et al., 2001).

- Research and development activities at the VHA were also aligned to support the mission. The new system was described as identifying “research evidence to support best practices” and variations from best practice, and then implementing “or translating” research evidence into clinical best practice (Kizer, et al., 2000).

Change Management

Since the VHA began its transformation in the mid-1990s, an estimated 700,000 more patients were cared for in 1999 than in 1994. Three hundred outpatient clinics were established during these years with no new appropriated funds, but through the savings realized from other innovations. These results came about through a series of mutually reinforcing actions:
Kizer created a vision of change through an intensive planning process lasting several months. A senior leadership team met with individuals from across the organization to spread the word on organizational innovation, strategic principles, and objectives for change.

Legislative change was sought and obtained. Patient eligibility changes were essential if the VHA was to treat the whole person and to implement the shift to outpatient care. Eligibility rules were changed to allow treatment to occur in the most appropriate setting, whether in an inpatient or outpatient setting (Kizer, 2000).

Recruiting network leadership was a key to the successful implementation of the VISN system. Kizer involved himself deeply in the recruitment of network directors.

Change did not come easily or smoothly. In spite of Kizer’s and other leaders’ extensive efforts to communicate change via journal articles and lectures, many frontline employees were not totally informed about the changes proposed and implemented by Kizer and his top-level staff (Young, 2000). Although VHA had 240,000 employees, the Secretary’s office of the Department of Veterans Affairs viewed all DVA “communications” functions as issues of external press and public relations. It failed to appreciate the value of using communications for internal management purposes and repeatedly denied Kizer’s requests to develop an internal communications function.

**Relevance to EPA**

Customs is a multifunctional organization charged with protecting our borders, enforcing international trade laws, and collecting tariffs, while at the same time facilitating trade. An important reason for selecting Customs as a case study was because of the significance of its enforcement responsibilities, which by volume and frequency, are more extensive than EPA’s. Customs has found a way to get much smarter about how to target limited enforcement dollars through strategic use of intelligence (made possible by better data gathering and record-keeping) and leveraging the private sector’s self-interest in high compliance rates alongside rapid processing times. Further, the relationship between Customs’ headquarters and the ports of entry have some parallels to EPA’s relationship with the states. Another salient feature of this case is Customs’s use of new capabilities of information technology to fundamentally change business processes. Ultimately, legislation was necessary to move the transformation forward.

**Causes of Change**

Beginning in the 1980s, Customs has been in a near-constant process of change, begun initially as an effort to automate paper processing of imports, boosted by the far-reaching Customs Modernization Act of 1993, and further propelled by major process redesign and reorganization efforts in the mid-1990s. Over the last 20 years, the most compelling force for change in Customs has been the growing gap between increased responsibilities and static resources to meet those responsibilities. Trade is expected to continue to grow at a rate of 8 to 10 percent per year (Bonner, 2002). Trade facilitation has also taken on far greater significance since the 1970s. Yet, centuries-old laws constrained some of the most important changes needed to make Customs more efficient and effective in protecting national borders. Customs needed a new risk-informed strategy for compliance and enforcement to focus their efforts on their highest priorities.
Innovations

The Customs modernization process began in the early 1980s as an effort to automate its paper transactions to clear imported goods at ports of entry. In the process, Customs leadership began to glimpse the transformational potential of information technologies to change the way they did business. The change process ultimately led to the passage of the Customs Modernization Act of 1993. The Act required major changes in Customs’ approach to import regulations and enforcement, eventually affecting about 80 percent of Customs’ regulations.

- The Modernization Act introduced the concepts of “informed compliance” and “shared responsibility.” Importers and brokers were expected to assume the burden of compliance while Customs was expected to make every effort to clarify and communicate the rules. The overall business goal was to raise compliance, not necessarily increase the number of enforcement actions. However, in tandem with account-based management, enforcement efforts are better focused and more productive. Informed compliance required significant culture change.

- In implementing the informed compliance and problem-solving program, Customs found a means of empowering officials throughout the organization to take initiative and work outside normal procedures to get a specific problem solved. Many enforcement problems are place-specific, and thus require the expertise of local Customs officials. Other problems are systemic and require a national response.

- Customs adopted the concept of business process improvement (BPI), a popular method in the private sector, to improve performance by understanding how multiple offices and activities affect core organization-wide functions (Rummler and Brache, 1995). Customs identified its core processes as Trade Compliance (imports), Passenger Clearance (in and out), and Outbound Compliance (exports). Its support processes are information and technology, finance, and human resource management. For each process, a process owner was designated to lead the process mapping exercise, identify weak links, duplication of efforts, develop options for change, and implement improvements.

- Customs is moving toward an account-based system that is not solely tied to the individual transaction at a specific port of entry (geography is no longer important). This provides the basis for more sophisticated analyses of trade – useful for targeting inspections, compliance services, managing tariff collection, and enforcement actions. Customs can now look at import activity by company and size.

- Customs eliminated its regional middle management layer to provide more resources at the ports of entry. Customs Management Centers were created to improve the delivery of common administrative services to the individual ports, and were thus largely transparent to customers.

- Customs leadership had engaged a Joint Industry Group and other stakeholders, and developed options relevant to existing conditions (trade volume, business practices, mission objectives, and information technology). As a result of this, work leaders were able to influence new legislation when the opportunity arose (in NAFTA). The resulting legislation supported the changes deemed necessary to improve operations.

Change Management

Customs has made considerable progress over the last decade in becoming a more innovative and flexible organization without compromising its duties to protect national borders. It has built its transformation on the promise of new information technologies and organizational change to fit its goal to “think like business.” As important as these steps, Customs also came to understand the necessity of communicating new directions to frontline workers and providing adequate training and tools to accomplish their duties.
In the late 1980s, Customs’ assistant commissioners engaged in a “Day One” exercise in scenario analyses to develop a new model of the organization as if starting from scratch -- independent of historical practices and including the capabilities of information technology.

Strong, visionary leadership was crucial. Senior staff within Customs had begun planning for legislative change several years before final passage of the Modernization Act. Congress also had its own interests in Customs’ modernization. The staff director of the House Ways and Means International Trade subcommittee, George Weise, played a key leadership role in negotiating compromise legislation. Weise later became Commissioner and initiated implementation of many of the provisions of the Modernization Act.

Prototyping is used in virtually every facet of Customs’ operations, including new information products, new enforcement technologies, and new management methods. As a general matter, Customs initiates prototypes, comprehensively reviews success rates, and then makes a management decision, based on results and available resources, to move toward more system-wide deployment. Customs relies on normal budget and appropriations processes to fund prototypes.

A prototype was developed to test the account-based processing approach using 10 importers selected by Customs. At the same time, Customs began to prototype the idea of account managers to work with selected high-volume accounts to improve compliance. Customs now has over 1,100 companies in the Customs Account Management Program: 275 are managed nationally and 844 are managed locally at ports of entry (U.S. Customs Service, 2000).

### DuPont: Key Findings

- **Change Management**
  - Used leadership to signal and sustain change
  - Used structured innovation processes (Apex ® and PACE ®)
  - Formed Innovation Board with senior staff
  - Developed innovation agenda and ten-year plan
  - Established Center for Creativity and Innovation
  - Exploited knowledge from across the organization
  - Incorporated information from external sources
  - Aligned incentives for technical staff with mission and goals
  - Empowered innovation leaders with funding and authority
  - Nurtured innovation networks

### Relevance to EPA

The DuPont case illustrates how innovation was coordinated at the corporate level and provides some insights into the respective roles of corporate and business units. It also presents a fairly complete picture of what activities are required to sustain an innovation system. This case provides some insight into how EPA headquarters might work with regions and states to develop an integrated innovation system.

### Causes of Change

In the late 1980s and early 1990s, concern over innovation and creativity was expressed in at least three ways at DuPont. First, in 1985, outside consultant Gifford Pinchot conducted a company-wide “Innovation Audit” to assess the supports and barriers to innovation. Second, in 1989, a corporate survey of employees found that while innovation was viewed a key corporate value, employees identified the need for more encouragement and focus (Tanner, 1997). Third, a long lull in major new products was noted by investors (McMurray, 1992). The critique was attributable to the shorter term focus of R&D in the late 1980s and early 1990s as well as the noticeable absence of breakthrough innovation at DuPont (Miller, 1997).

### Change Management

As a result of these pressures, DuPont took a number of steps in the 1990s to increase the effectiveness of its research and development investments. Note that virtually all of these actions fall within our definition of change management.
DuPont established a corporate-wide Technology Council comprised of the senior technology leaders in the company - from the business units and corporate research. The council met monthly to discuss and review research opportunities outside current businesses, emerging technologies, and routes to needed research competencies. This group provided leadership, direction, resources, and coordination for incremental, enabling and breakthrough research.

The Technology Council developed an innovation agenda and a ten-year technology plan. The agenda identified the key technology areas driven by the corporation's strategic plan and showed how the business units’ R&D investments would contribute to these areas. Each business unit also prepared ten-year technology plans that mapped out multi-generational technology roadmaps (somewhat similar to efforts at GE and Motorola). The plan focuses attention on important issues, guides investment decisions, and ensures that the portfolio addresses short-term and longer-term objectives.

DuPont adopted a structured development process, Product and Cycle-Time Excellence® (PACE®), and instituted the “Apex” process for breakthrough research. Product and Cycle-Time Excellence® is used to manage product developments at the business unit level, which are typically incremental and short term. The PACE® process has five key elements: a multifunctional project core team; a project approval committee (PAC) involving key business leaders who can commit resources (budgets, people, facilities); a project timing roadmap; definite phase reviews of the project at critical milestones by the PAC; and a PACE® engineer or leader who sees that the innovation process works. At each milestone, the PAC gives a “go or no-go” decision on whether to continue the project. For example, experience with the PACE® process showed that project cycle time could be reduced by almost half, because decisions are required in a timely fashion and projects are fully resourced. Project quality improved as well. In contrast, the Apex process is managed at the corporate-level, with funding from the CEO (as opposed to controversial R&D taxes on business units). The Apex Board, comprised of business and technical leaders, selects projects for funding based on an assessment of whether the research will generate a major new business (McGrath, 1996).

DuPont encouraged the formation of technology-related networks. Networks were utilized to bring together the breadth and depth of knowledge necessary to solve a given problem (some within a 48-hour time frame). By the mid-1990s, DuPont had 230 technology-related networks and 140 other networks (Norling, 1996). In addition to problem solving, networks can also be used to bring in the various functional perspectives necessary to see a new idea through to full implementation; disseminate good ideas; and keep DuPont linked to changes in the external environment and customers.

DuPont restructured personnel rewards in part by enabling researchers to receive pay and benefits equal to that of laboratory directors. DuPont also changed performance rankings procedures to encourage researchers to work on more significant long-term projects. Incentives had been such that researchers were led to focus on short-term projects with high probabilities of success rather than longer term, risky breakthrough projects.

DuPont created a Center for Creativity and Innovation. The Center provided information on workshops, educational materials, and other skill building techniques; built networks of facilitators and creative thinkers; ran problem-solving workshops; and provided grants of $5,000 to $50,000 to any employee who wanted to pursue an idea that could not be funded from traditional sources. After several years, the Center was no longer considered necessary.

The Pinchot innovation audit proved to be an important antecedent to the need to change business practices and structures to encourage innovation. It identified the large disconnects among stated corporate goals, R&D investment decisions, and human resources practices. Driven by focused and sustained corporate leadership, DuPont subsequently implemented a highly structured system to encourage, support, fund, and sustain innovation.
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**Marriott: Key Findings**

- **Innovations**
  - Transformed model from hotel ownership to management
  - Blended consistency with innovation
  - Used performance measures to manage brand protection
  - Segmented hotel market by customer preferences
  - Created culture of “Associates First” to retain employees
  - Used information technologies to improve service and profits
- **Change Management**
  - Communicated role as provider of quality service
  - Supported innovation with HR practices and rewards
  - Used local settings to test new ideas

**Relevance to EPA**

Because of its decentralized franchise operations, Marriott has relevance and value as an analog to EPA’s state delegation and permitting processes. Another important feature of this case is the fact that Marriott has struck a profitable balance between enforced compliance with standard operating procedures and active encouragement of innovation and problem-solving among its front-line and corporate employees. In the process, Marriott has demonstrated how to effectively align human resources practices to corporate goals.

**Causes of Change**

In the early 1980s, Marriott began to diversify its business through purchases of fast food restaurant chains and amusement parks, but came to recognize later in the 1980s that they did not understand these other businesses particularly well. At about this same time, Marriott had become one of the largest real estate developers in the United States. However, by 1990, the real estate market began to weaken significantly and an economic recession took hold. The company edged dangerously close to bankruptcy, prompting layoffs and project terminations (Marriott Jr. and Brown, 1997). To add further to the crisis, CEO Bill Marriott around this time suffered two major heart attacks. The need to change was hence thrust on the company from a combination of external forces and internal missteps.

**Innovations**

The key to Marriott’s turnaround came in recognizing the value in franchising. Franchising hotel management services shifted ownership risk to the franchisee, allowing Marriott to concentrate on its core expertise in operating hotels and other types of lodging and housing services. Marriott would still build hotels, but it would immediately sell the properties, and at the same time, enter into long-term management contracts.

- Marriott’s franchising business requires strict adherence to standard operating procedures, analogous to regulations and permits. However, Marriott also recognizes that specific circumstances with individual properties and guests require flexibility. Associates are strongly encouraged and empowered to solve problems on the spot, and not wait for permission from corporate managers.

- Marriott uses a Balanced Scorecard to recognize top performers, stimulate information sharing, generate internal competition among hotels within a given region and brand, and enforce accountability to corporate standards. Hotels are given scores in four areas: customer satisfaction, associate satisfaction, financial results and working order. Ratings are given through a numerical score and a traffic light system for each of the four areas. Hotels in the top 20 percent receive a green light; those in the 50 to 80 percent range, a yellow light; and those in the bottom 20 percent, a red light. The Balanced Scorecard is done for each hotel and can be viewed by all other hotels franchised or owned by Marriott International. The results are used to identify top performers for recognition. High ratings create celebrity status among hotels. These hotels then offer advice to others on best practices and innovations.

- Poor performers receive heightened management attention, for example, regional vice presidents will call individual hotels that receive red lights. If the hotel does not improve by the following quarter, it will receive a letter. In 9 months, if performance is still not improved, the hotel either loses its franchise rights or it must commit to fix all problem areas. To promote performance improvement, the brand standards are continually being raised. Franchisees are told from the start about the system and the fact that higher standards will be expected over time.
Marriott evolved multiple brands and segmented the lodging market to deal with different types of customers. This is analogous to the vast differences within the regulated community by sector, size, and willingness or ability to improve on performance outside of the box of conventional regulatory solutions. Marriott was able to expand its market share in the lodging industry by catering to different classes of customers, and improving their delivery of services to the various market segments.

An associate-first culture recognizes that the staff is the most critical asset in hotel operations. The culture reinforces long-term employee growth and satisfaction, which in turn contributes to innovation; staff understand that they have a stake in the success of the enterprise.

**Change Management**

Marriott has pioneered methods of communicating with front-line employees on a daily basis about corporate goals and values. Corporate value rests with Marriott’s name and reputation for quality, even with multiple brands providing different kinds of lodging services.

New ideas that meet the test of improving some measured aspect of performance are diffused through the organization, typically beginning at the local level and then moving through Marriott’s regional network.

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**Procter & Gamble: Key Findings**

- **Innovations**
  - Established “key customer” liaisons
  - Implemented model of “Connect and Develop”
  - Funded “communities of practice” across organization
- **Change Management**
  - Structured process to develop new brands
  - Invested and supported internal collaboration, new ventures
  - Experimented in the marketplace
  - Established Innovation Leadership Team
  - Supported change through sustained leadership
  - Provided rewards and recognition for innovators
  - Focused incentives on quality of work more than money

Relevance to EPA

The Procter and Gamble (P&G) case is similar to the DuPont case. Both illustrate how innovation was coordinated at the corporate level and provide some insights into the respective roles of corporate and the business units. Key elements of a system for innovation are identified. This has relevance to how EPA headquarters might work with regions and states to develop an innovation system that involves all offices.

Causes of Change

Until a few years ago, P&G had not introduced a new brand since 1983. Because of this lull, and changing conditions in the research enterprise, P&G rethought the way in which it brings new technology to products.

Innovations

Improving the flow of information with P&G as well as with customers, suppliers, and outside innovators was central to P&G’s turnaround. P&G took several steps to build better relationships with suppliers, distributors, and customers; and actively sought linkages to external sources for new ideas and technology.

A major part of P&G innovation activities is the “Connect and Develop” concept. Simply stated Connect and Develop encompasses activities that improve the flow of information (horizontally, vertically, internally and externally) to make the connections necessary to generate and implement new market ideas (Sakkab, 2000). Key customer liaisons, communities of practice, global technology forums, joint venturing, and a recent exposition called Innovation 2000 are all part of Connect and Develop. These connections provide information and cross-fertilization on customer needs, technology capabilities and options, and supplier capabilities.
There are 20 formal communities of practice, each of which is sponsored by a R&D vice president (some are funded). Focus areas include biotechnology, packaging, and perfumes and flavors (Sakkab, 2000). They accomplish this in a variety of ways. The network may be used to locate subject experts, or to solve a problem. Some hold seminars. Each community is sponsored by an R&D vice president and some have full-time staff leading them.

**Change Management**

Senior leadership at the CEO-level has been the most critical factor in P&G’s success. For example, the CEO actively participates in decision-making (funding innovation is good, but not sufficient). An important reason for CEO involvement is the likelihood that new products will often make existing products obsolete. Active CEO engagement in decision-making helps deal with the inevitable internal resistance to some innovation. The P&G example also shows how leaders influence the culture necessary for successful innovation by unambiguously demonstrating an interest in experimentation and risk-taking. Setting goals to move beyond the status-quo is one way of doing this. P&G’s use of brand competition is an example of a strategy to eliminate complacency.

Changes in human resources practices were also significant factors in creating a culture of innovation within P&G. There are three principles that guide human resources practices at P&G. The first, and most important, is to provide challenging and interesting work. The second is to recognize the contributions either through honorary societies or through bonuses. P&G established a trust fund to recognize and reward innovators. The third principle is to recognize that a relatively few managers and technologists play a major role in stimulating change. To and learn to tap into their capabilities, P&G has dual career paths that allow technologists to achieve commensurate pay without taking on management responsibility (James, 2002). P&G also discovered that non-monetary rewards in the form of more rewarding work experiences can offer as much, if not more, incentives to innovators than bonuses and pay increases.

An Innovation Leadership Team (ILT) supports innovation at the corporate level. This serves as the company’s venture capital board. Its current annual budget is $225 million. The ILT may give ideas on how to serve customer needs; how to access outside alliances, or build relationships, sometimes these opportunities are identified during business strategy reviews. The ILT funds promising ideas and provides incubating services for others.
In the previous section, findings are presented for individual cases. This section summarizes findings in the form of common themes that emerged when these organizations and their transformation processes are taken as a whole. Findings are organized in terms of: (1) characteristics of innovative organizations (their “current state”), and (2) change management. The “current state” and change process models presented for these two purposes provide the structure for the following slides. In some instances, the distinction between these two sets of actions is not always sharp; overlaps exist. We have tried to minimize redundancy, but it nonetheless remains in a few areas, most notably in mission, goals, and priorities.

Innovative organizations use performance-oriented management systems for guiding and stimulating innovation. In each case, change was centered on the mission or strategic focus of the organization and permeated all the primary functions and processes. This typically involved refocusing or clarifying the organization’s mission in light of external changes (e.g., customer base, market conditions, and new technologies). All cases employed some type of performance measures for managing operations and evaluating new approaches.

The text below each slide has up to three subsections. The first subsection summarizes key findings, but does not repeat all of the information on the slides. The second subsection encapsulates the implications of these findings for EPA. Finally, the third subsection summarizes some additional material from the business literature that supports or adds to the findings. Not all the slides have accompanying background information.
At the VHA, Kizer introduced an accountability system built around performance contracts for VISN directors (Kizer, et al., 2000). These contracts linked performance goals with financial incentives. The accountability system served to align the performance objectives of network directors with the strategic objectives of VHA. They also signaled to the entire VHA the importance of the central office’s concern for improving institutional performance (Young, 2000).

Marriott uses a Balanced Scorecard to recognize top performers, stimulate information sharing, and generate internal competition among hotels within a given region and brand. To promote performance improvement, the brand standards are continually being raised. Franchisees are told from the start about the system and the fact that higher standards will be expected over time.

**Implications for EPA**

Whether change is incremental or more radical, the actions addressed on this slide must occur within EPA if it is to become an innovative organization. Practically speaking, consensus on mission and strategy at the highest levels of the agency may be difficult in the near term. Congress and the states would need to be fully engaged in any major directional change. On a more modest scale – still with Congressional and state involvement – a clearer focus on goals, measures, and priorities within regions and offices could lead to improved performance and more effective allocation of resources. Subsequent slides reinforce the point that clarity of mission, goals, and priorities were integral to every action taken.

**Background**

Measures, aligned with core purpose and priority areas in the strategic plan, focus attention. Performance measurement with accountability creates an internal stimulus for change, establishes a basis for resource allocation, and provides a benchmark for characterizing improvement. Goals that align with the strategic priorities, and raise the bar for performance, will motivate managers and staff out of established routines and practices. Making people accountable for attaining goals provides another incentive to action. Updating goals creates pressure for sustained innovation. The literature and the Marriott case suggest that internal competition can also lead to pride of accomplishment and force for change (Kotter, 1996; Resetar et al., 1998).

The published business literature on the topic of metrics is vast. We offer a few guidelines. First, metrics should relate to the key goals of the organization (identified in the vision and strategic plan) (Camm, et al., 2001; Dow and Cook, 1996). Ideally, metrics will measure outcomes, not inputs or outputs, are easy to collect and verify, and can be affected by the decision maker held accountable (Camm, et al., 2001). These measures will likely differ at different levels within the organization. And, because quantitative metrics can rarely capture everything important, proactive firms typically supplement quantitative metrics with qualitative metrics (Camm, et al., 2001). Baldwin et al. (2000) provide excellent examples of how to tailor performance measures to specific types of management questions.

Many corporations have goals to stimulate innovation. For more than 10 years, 3M has had a stretch goal for its sales; aiming for 30 percent of sales from new products less than 4 years old since 1992. Goals that are intended to motivate are typically referred to as stretch or as Collins and Porras say “big, hairy, and audacious” goals (Collins and Porras, 1997; Dow and Cook, 1996; Resetar et al., 1998). These incentives need to be carefully structured to yield the intended benefits.

Goal setting in public sector organizations can be particularly challenging for two reasons (Behn, 1999). First, it is politically difficult to get agreement from all stakeholders on goals, especially those that measure outcomes (which are preferred from an analytic point-of-view). In certain circumstances, it may be better to choose a less politically charged goal that approximates a desired outcome in order to reach consensus among stakeholders. Second, Behn notes that public organizations are designed to oppose change.
As the length of the preamble to any authorizing legislation demonstrates, we ask public agencies to accomplish multiple objectives. Rarely do we tell a public agency to concentrate on one specific goal (or even on three). As a result, a public agency will have different units pursuing different parts of its authorizing legislation. We do not want these different units to change direction every time the agency gets a new boss... Moreover, for any public agency, we fix the key dimensions from the outside. We place multiple line items in the budget; we define narrow personnel categories, job descriptions, tight salary ranges; we create seniority and bumping rights; and we firmly control hiring and promotion (Behn, 1999).

Nonetheless, Behn recognized the need for consensus on goals. He observed that successful public organizations had persistent leaders who used whatever means were available to them to make staff accountable for improving the established performance measures and attaining goals. Kizer at the VHA exemplified persistence in the face of opposition.

Summary of Findings

The set of characteristics labeled “Employees and Organizational Capacity” within the model of innovative organizations encompasses both the “hardware” of organizational structure, as well as the “software” of culture, incentives for innovation, training, and support/knowledge networks.

In each of the case studies, form followed function in the sense that some degree of organizational change was typically necessary to improve the organization’s capacity to meet its mission and strategic goals. The cases provide examples of both consolidation and decentralization. While different means were used, in nearly all cases, the ability to measure performance and enhance accountability of senior leadership enabled greater room for individuals to exercise judgment and solve problems (i.e., flexibility with accountability) at the point of service delivery.

- The VHA organization was revamped from a hospital-based system to an integrated service network (VISNs). VISN directors were held accountable for performance using a set of well-defined metrics aligned with the refocused mission and priorities of the VHA.

- At the FDA, organizational change was made to increase the number of directorates and divisions and improve the efficiency and quality of the new drug review process. This change eliminated a potential bottleneck and had the added benefit of allowing a number of good people to assume senior leadership positions in the agency. Because the review process became more standardized across divisions, discipline-based communities developed and shared information.

- Customs established the Office of Strategic Trade in headquarters to provide leadership, analysis, strategic thinking and coordination. It also restructured its provision of administrative services to the ports through Customs Management Centers. Customs enabled decentralized decision-making at the ports using new compliance measures and strategic problem solving. Officials at all levels were empowered to use compliance measurements to identify problem areas and then devise appropriate solutions to address them (Sparrow, 2000).
Marriott’s use of the Balanced Scorecard opened the door to regional and local control of franchise management by imposing a consistent measurement system, within which experimentation and innovation could occur (and be measured).

**Implications for EPA**

Organizational change in public agencies can be highly disruptive and ineffective if not accompanied by mission-driven motives and the array of cultural supports and budgetary resources to accomplish and sustain the desired change. The public sector case studies demonstrate that organizational change can be justified and supported when the rationale for change is clear. Decentralized decision-making is not an end in itself, but a means of improving the problem-solving capacity of the organization. However, localized problem-solving in the context of a regulatory agency works when built on a foundation of credible enforcement and performance measures that track outcomes, not inputs.

**Summary of Findings**

Organizational capacity goes well beyond structural change to include significant change in culture and engagement of employees at all levels of the organization. Not only did the organizations measure their overall performance with new metrics, they also needed new metrics to evaluate individual employee performance. This was a critical step in each case. Further, routine access to training provided a continual source of reinforcement of organizational values that substantially added to a climate of innovation. The private sector cases have shown the most proficiency in this area.

Marriott has many training activities to ensure staff are aware of corporate policies and procedures. Initial training is reinforced daily on-site with tailored messages. Because employee retention is important to the business, employees are encouraged to establish career goals and are given some assistance (either in the form of time or promotion opportunities) toward their goals. Good ideas are disseminated to hotels and staff through regional networks.

DuPont has used professional consultants at times to teach staff specific project management techniques for example. The Creativity and Innovation Center at DuPont had a small core group that could reach out across the business units, inspiring local champions to become active in learning and applying creative thinking tools in driving innovations. The Center, which was eventually disbanded, provided information on workshops, educational materials, and other skill building techniques.

Customs leaders learned that change requires widespread, systematic, and frequent training for frontline workers if the new ways of doing business are to have a chance of succeeding. For some employees, change came too fast. In Customs, employees were not always aware of changes occurring; at other times, they had too much information to process at one time. Leadership recognized these problems, but some also believed that there was value in getting quickly past the “pain” of reorganization.

Internal and external networks and cross-functional teaming are two other means of improving staff’s ability to acquire and utilize knowledge. Networks bring ideas together, expose individuals to alternative perspectives internally as well as externally. Networks can be used to cheaply and quickly disseminate information about good ideas. They can also be used to keep the organization linked to changes in the external environment and customers.
DuPont had over 400 formal and informal networks to transfer technology throughout the company similar to the “technical societies” at Monsanto and 3M. “In one year; networks in DuPont reduced costs by hundreds of millions of dollars, reached decisions on preferred suppliers, developed standards and guidelines, conducted training and development workshops, provided the basis for significant sales, provided support and critical information, transferred technology across the company, helped in the reuse of equipment, established numerous collaborations and avoided duplication of work (Norling, 1996).”

Procter and Gamble has 20 funded communities of practice, which are networks of individuals working in specific areas. These communities are part of P&G’s overarching “Connect and Develop” initiative, based on the premise that innovation is improved if user needs can be closely coupled with capabilities across the organization and elsewhere. Members have a stronger sense of purpose, needs and possibilities as a result of these networks. On-line seminars and information sharing is performed here as well.

Implications for EPA

Actions in this domain are among the easiest to control, and yet they are least likely to get the attention they deserve in a change process. The cases present an extensive menu of choices for EPA to consider, including DuPont's Creativity Center, P&G’s “Connect and Develop” model of innovation, and Marriott’s multiple methods of communicating with employees. It may be worth ascertaining how effective these networks are relative to EPA’s own existing listserves and networks. Pay, promotions, and recognition policies and programs were important features of each of the cases, serving to align individual incentives with core business objectives and clearly signal management commitment to “walk the innovation talk.”

Some actions require long-range planning. For example, one approach to infusing an organization with fresh thinking might be to use opportunities presented with retirements, a situation likely to be faced at EPA in the coming years.

Background

A key element for innovative organizations is ensuring the individual understands the business model and the role innovation plays in achieving organizational objectives. This requires that employees have a systems view of the organizational purpose and functions, and that leadership takes a broad view of employee responsibility. This can be accomplished in part by taking a broad view of employee responsibility (as opposed to a narrow, functional role) (Kotter, 1996).

Literature on innovative firms also notes that training in technical and “softer” skills of teamwork, idea generation techniques, and managing specific innovations is often overlooked even though these are important skills present in innovative companies (McGourty et al., 1996). Individuals’ problem-solving skills and capacity for creativity ultimately enable innovation to succeed (Prather and Gundry, 1995).

Internal networks and cross functional teams (at the right time in the process) that combine different points of view and skills help generate interesting ideas (Kanter, 1997; Kotter, 1996; Leonard-Barton, 1995; Tushman and Anderson, 1997).
Summary of Findings
Among the cases, different methods were used to empower and mobilize employees.

- At the VHA, Ken Kizer was deeply involved in the recruitment of the VISN directors, hiring about one third from outside. However, some of the new VISN directors were thrust into a new system without access to training in such skills as performance contract negotiation, capital budgeting, and outsourcing.

- The VHA used aggressive means to advance rising stars to senior leadership positions, and actively sought leaders outside of the organization who shared a common vision and attitude toward innovation.

- P&G’s excellence in market research translated to attention to employees’ concerns and attitudes toward work, a vital element in a culture of innovation that depends on highly motivated people.

Implications for EPA
Employees, and in particular middle management, need a compelling motivation to innovate. If senior leadership cannot convincingly answer the question “Why should I do something different from what I’m doing now?,” then the chances are vanishingly small that a culture of innovation can arise and thrive.

Civil service rules are often cited as roadblocks to innovation in the public sector because of the protections they afford employees from precipitous and politically motivated personnel actions. Nonetheless, FDA and VHA were able to overcome some of these limits to build senior leadership teams committed to change. However, both Congressional support and internal leadership were critical.

Background
Huge investments of energy and focus are required by the leadership to overcome the inertia of a culture of complacency to achieve a culture of innovation. Kotter (1996) has observed: “Never underestimate the magnitude of the forces that reinforce complacency and that help maintain the status quo.” They are “subtle” and “systemic”. He has found many ‘sources of complacency:’

- Too much happy talk from senior management.
- Absence of a major and visible crisis.
- Too many visible resources.
- Low overall performance standards.
- An organizational structure that focuses employees on narrow functional goals.
- Internal measurement systems that focus on the wrong performance indexes.
- Lack of sufficient performance feedback from external sources such as external stakeholders.
- A kill-the-messenger of bad-news, low-candor, low-confrontation culture.
- Human nature’s tendency toward denial, especially when busy or stressed (Kotter, 1996). “
He suggests that bold, not modest actions are required to overcome these forces. Outsiders or stakeholders, especially those with different perspectives on the organization, can be routinely queried to ensure the level of urgency is great enough (Kotter, 1996).

### Summary of Findings

Business processes reach across the entire organization. Their efficiency and effectiveness, however, depend critically on how well internal organizational barriers are transcended. Some refer to this as the systems view of the organization. In each of the cases, some means was used to create ownership of organization-wide processes, systems of accountability, and strategic planning to guide change and improvement in performance.

- Customs adopted the concept of business process improvement (BPI), a popular method in the private sector, to improve performance by understanding how multiple offices and activities affect core organization-wide functions. Process owners worked with process redesign teams formed from headquarters and field office staff. The Trade Compliance Process redesign is largely viewed as a significant milestone in connecting the power of information technology to Customs’ informed compliance strategy. The redesign team grasped the significance of compliance performance measures as a means of driving process improvements and communicating progress internally and externally.

- The VHA fundamentally revamped its concept of service delivery to veterans, from specialized in-patient services to a continuum of care model. This required a major readjustment in budget allocations, consolidation of regional services, and a major shift in the VHA’s hospital-centric culture.

- DuPont revamped its approach to research and development through a structured process of moving ideas through successive stages of testing, development, and marketing.

- P&G adopted the “Connect and Develop” process of new product marketing, linking researchers to customers early in the process.

### Implications for EPA

Many similar functions like permitting and regulatory development are carried out within individual offices, reflective of an organizational structure built to mirror the major environmental statutes. This approach to process was not explicitly designed to optimize environmental protection benefits or efficiently allocate public and private resources. Prior attempts to improve process have largely been motivated by pressure from the regulated community. The continuing challenge for EPA leadership is to articulate the agency’s own compelling view of environmental benefits and public sector cost savings, and then align management and budget resources to support change.
Summary of Findings

Information technologies (IT) played an important role in transforming the business model or key business processes within nearly all of the organizations. However, like innovation itself, applications of IT must be grounded in the strategic needs of the organization. The cases demonstrate the need for senior program leaders to understand the role IT can play.

- Customs presented the most significant IT-led transformation by enabling a new way to view the totality of individual import transactions in terms of the importer and sector, enabling a much broader view of compliance issues and a quantitative basis for setting enforcement priorities.

To provide a continuum of care by the regional integrated service networks, the VHA needed to overhaul its patient record-keeping. That process is still underway.

- DuPont and P&G both implemented knowledge networks that depended on widespread use of email and web-based group discussion software.

- Marriott’s hotel management strategy depends on the availability of information and services to its franchisees and associates through the web. For example, Marriott has a sophisticated nationwide, web-based reservation system that enables cross-marketing among Marriott’s various brands.

Implications for EPA

The cases clearly show the transformative potential of IT on business processes. The Office of Environmental Information may wish to take a closer look at the Customs approach to IT-led process change. Customs used IT to alter its entire approach to monitoring, compliance, and enforcement by enabling a consolidation of individual transactions to the level of importer accounts, irrespective of port of entry. The key is a systems view of information management coupled with a clarity of mission, transcending entrenched and fragmented legacy systems. This will require a high degree of education of senior leadership about the potential for overhauling core processes.

Summary of Findings

Innovation requires investments in people, training, seeding of new ideas, prototyping and evaluation, and scale-up. Savings that may ultimately result from successful innovation may take years to realize. Institutionalizing a budget and funding process for innovation was a common action among all the organizations studied.

While innovation is almost always motivated by the prospect of profitability within the private sector, it nonetheless requires a predictable stream of investment to create and sustain the motivation
to generate, test, and follow through on new ideas. Similarly, the public sector organizations each devised a plan to pay for change. In each case, Congress played a pivotal role. Most of the organizations found some way to finance innovation, through user fees, special CEO funds, or direct appropriations from Congress.

- Congress granted FDA the authority to collect fees from industry to fund additional staff required to review new drug applications in shorter time frames.

- The VHA ultimately was able to serve more veterans following its transformation at approximately the same level of resources used to support the older, failing system. An overhaul of budgeting within the VHA was a key component of change. A recent RAND analysis concluded that “in spite of [Veterans Equitable Resource Allocation] VERA’s possible shortcomings, we note that VERA appears to be designed to meet its objectives of reallocating resources to match the geographic distribution of the veteran population more closely than did previous VA budget allocation systems (Wasserman, et al., 2001).”

- Customs acquired specific funds from Congress to fund its IT upgrades, which provided the springboard for subsequent change in business processes.

- CEOs at DuPont and P&G established special innovation funds to deal with the inevitable protection of existing product lines and the potential for innovation to supplant business units and personnel.

**Implications for EPA**

The President’s budget is the most consistent indicator of an agency’s priorities (viewed through the lens of the Administration), at least as it passes from the Office of Management and Budget to Congress. FDA, VHA, and Customs found ways to work with OMB and subsequently with Congressional appropriators to support innovation and change within their agencies.

**Summary of Findings**

In each of the cases, organizations explicitly recognized their need for higher levels of responsiveness to their outside constituencies.

- In the case of the public sector organizations, this translated to active engagement with the regulated community (Customs and FDA) and the veterans’ organizations for VHA.

- For DuPont and P&G, improved linkages with key customers and technology holders were central to their transformation processes.

- Marriott’s entire business model of franchise management was designed around the imperative to build strong relationships with franchisees, based on shared goals for performance and brand quality.

Strong linkages also improve the organization’s capability to exploit ideas and opportunities from other sources. The case studies used a variety of approaches to improve the information available for making decisions, and for establishing priorities on innovations. These included working groups with stakeholders, surveys of major stakeholders and staff, internal and external networks, and specific job responsibilities. Most involve getting better information on stakeholder or customer needs. Innovative organizations are not static; they evolve to maintain effectiveness with the dynamic environment.
Kizer personally monitored healthcare delivery trends in the private sector and Veterans Integrated Service Network (VISN) directors have the authority and flexibility to establish partnerships and alliances with other healthcare providers. Because of its role in physician training and clinical research, the VHA maintains close ties to medical universities.

Customs had input from the Joint Industry Group, representing the private sector involved in international trade, on issues for the Customs Modernization Act. When implementing the Act, Congress intended for Customs to work closely with the trade community as it moved forward on automation, regulatory change, and other initiatives.

The private sector maintains external linkages in a variety of ways for a multitude of purposes – to track market trends, customer needs, regulatory changes, technology options, and competitor threats. While many of the themes from private sector studies are not necessarily germane to EPA, two are: the importance of listening to feedback from the people and institutions the organization serves; and the value of soliciting new ideas from many sources to find robust solutions. Innovators excel at their ability to cancel a project if external forces change (Kanter, 1997).

Marriott estimates customer satisfaction using sophisticated survey techniques. Years ago, Marriott hotels had a comment card in every room, which was usually only filled out by those that were either angry, elderly or children. Similarly, employees learned to skew the system, stuffing the comment box with positive comments to make the hotel appear better than in reality. Marriott realized it wasn’t getting feedback from its main customers. Now, Marriott uses the more pointed Guest Satisfaction Survey, targeted to the dominant customer for each brand.

DuPont has 400 networks, some of which extend outside DuPont. Depending on the purpose of the network they can include scientists and technologists from other organizations, suppliers and customers. The networks also cross business units and functional specialties within DuPont. Many of these networks are used to problem-solve. Another way DuPont, and most private sector organizations stay in tune with trends and motivate continuous improvement, is to benchmark processes regularly against other top performers. Cooperative ventures are another mechanism to bring together a broader base of expertise more quickly.

Procter and Gamble’s entire “Connect and Develop” concept involves linking information on needs and capabilities (connecting) to generate and implement new ideas (develop). To implement this paradigm, Procter and Gamble has initiated networks, alliances, partnerships and symposia with customers, suppliers, and its various business units. The Procter and Gamble staff, like those at 3M and other industrial innovation leaders, are taught to go 'behind the smokestacks,' that is, understand the customer problems so they can anticipate unarticulated needs (Kanter, 1997).

**Implications for EPA**

In all the cases, the organizations focused their management of external relationships by defining and advancing common goals with their regulated community, customers, and/or stakeholders. EPA has a fundamentally different relationship with the states than it has with other stakeholders and interests. At times this relationship can be adversarial, but for the vast majority of the agency’s work, relationships with the states are cooperative. The P&G “Connect and Develop” strategy is an example of how to manage a relationship between end-users and “upstream” developers that may have some applicability to the EPA/federal regulatory development process and the state implementation role.
Summary of Findings

This slide brings together several key points from the preceding discussion. In each of the cases, the organizations:

- Clarified their mission statement and revised their business model,
- Implemented performance measures and evaluated innovations in the context of goals and measures
- Routinely gathered new information from external sources and integrated it into their business operations.

Each of the public sector cases present compelling examples of how systems thinking enables organizations to sustain innovation. Ken Kizer was able to see the VHA in the context of an entire health care system, not simply a hospital-based, rule-bound bureaucracy. In their modernization process, Customs understood the need to take a step back from their paper-bound transaction processes to see the value of account management to raise compliance levels. As a consequence of its new legislative mandate, the FDA revamped its organizational structure and review processes to meet its new mission and priorities.

Among the private sector cases, Marriott presents an excellent example of effective use of information and performance measures to stimulate improvement and innovation. Through their use of structured decision-making processes for innovation, P&G and DuPont provide useful models of the role senior leadership can play in guiding and sustaining innovation. Both cases demonstrate the value of innovation leadership groups in establishing a transparent process of project review, funding, and follow-on investment.

Implications for EPA

The notion of systems thinking should not be viewed as the exclusive preserve of a small cadre of headquarters staff. Rather, it should permeate the actions throughout the entire agency, offices, and regions toward achieving improved environmental performance. This view must be embraced by senior leadership and managers, and rooted in a common and compelling view of mission, goals, and system-wide performance measures that trump narrower views. Agency-wide strategic planning and implementation of an innovation strategy ought to be mutually reinforcing and focused on better integration of core processes throughout the agency. In early 2003, EPA released an agency-wide, draft 2003-2008 Strategic Plan that lays out its five long-term goals for the future. Goal 5 of this Strategic Plan, “Compliance and Environmental Stewardship,” and the cross-cutting innovation goal write-up attempt to link EPA’s strategic planning and its innovation strategy (see www.epa.gov/ocfopage/plan/plan.htm)
We now shift from the characteristics of innovative organizations to the elements of the change process used to move to a higher level of innovation in the organizations studied.

The cases support the observation that no single action alone will sufficiently support innovation. As discussed in the earlier section on research method, an integrated process of prepare, support, and execute change has been shown to be the most effective way to initiate and sustain change (Moore et al., 2002).

An ensemble of actions is required to create individual incentives and capabilities; establish an identifiable management process for generating, evaluating and implementing innovations; and encourage an overall environment conducive to risk-taking and change to support and sustain innovation (Prather and Gundry, 1995). Innovative organizations have leaders who establish a clear and compelling vision, create alignment of the entire organization around that vision, and personally lead organizational change. They also establish an environment in which creativity and innovation can flourish, and they institutionalize good ideas by making sure they get implemented.

**Summary of Findings**

Not surprisingly, an important stimulus for major organizational change is the survival of the organization. In each of the public sector cases, there was widespread consensus that the organization was so out of step with the times that serious actions were needed to preserve some semblance of function and effectiveness. The consequent arguments for organizational, process and financial change were developed with major stakeholders (e.g., industry, veterans, Congress).

- Critical internal VHA reports and external reports by the General Accounting Office (GAO) in the early and mid-1990s set the stage for change by identifying key issues in service delivery, budget allocation, and eligibility rules.
The case for change at Customs was made by the dramatic increase in volume of imports and a flat-lined agency budget, the obvious advantages of information technology stymied by antiquated statutory requirements, and the press of additional responsibilities that would flow from passage of the North Atlantic Free Trade Agreement in 1993.

Marriott, DuPont, and Procter and Gamble faced financial challenges.

- In the early 1990s, the real estate market crash coupled with an economic recession almost led Marriott to bankruptcy and as a result the company sold off its real estate holdings to focus on hotel management.
- Both Procter and Gamble and DuPont had failed to produce a major new product for years – Procter and Gamble in nearly 20 and DuPont in over 10 – and were facing negative consequences in the capital markets.

Each of the public sector organizations actively responded to criticisms, and worked with stakeholder groups to develop a basis for legislative change.

- Change of patient eligibility rules was essential if the VHA was to treat the whole person and to implement the shift to outpatient care. VHA Director Kizer argued that eligibility rules needed to be totally revamped to put inpatient and outpatient care on the same footing, allowing treatment to occur in the most appropriate setting (Kizer, 2000). Congress bought the argument and eligibility rules were changed.
- In the case of the FDA, the PDUFA “deal” was a three-way agreement involving the pharmaceutical industry, the agency, and Congress. The legislation reflected an acceptance by industry of FDA’s argument that review times were lengthy because of a scarcity of reviewers. Thus, agency performance was linked to agency resource needs as the primary justification for the legislation.

Major organizational changes required legislative authority. In each case, leaders within the agency had prepared an argument for change, worked with stakeholders to develop the most appropriate focus for change, and actively sought legislative change. While the process of Congressional debate led to many compromises, Customs largely believed that it had managed to maintain some degree of focus and control of the legislative outcome. A study of public sector innovations observed that more radical change is more likely derived from legislative change than from internal design alone (Roberts, 1999).

The cases and literature are unanimous in acknowledging that innovation is not possible without the support, and indeed advocacy, of senior leaders (Bodilly, 1998; Borins, 2001; General Accounting Office, 1992; Kotter, 1996; Rostker, 1993; Young, 2000). All the cases show that leaders increase their effectiveness by developing and supporting a cadre of others in the agency who are willing to constructively challenge the status quo. Where there are barriers to innovation – such as legislative constraints, organizational stove-pipes, human resources practices, and limited information flows – leaders need to demonstrate their commitment to innovation by actively working to reduce or eliminate these barriers.

Implications for EPA
Agency leadership must be actively engaged in innovation over a sustained period for real change to occur. They must be able to compellingly answer the question of why change is necessary and articulate a coherent vision of the future. This clearly was done by the VHA, FDA, and Customs. To be convincing, leaders must take a systems view of the organization, focus on specific goals, and focus agency resources and communications on the steps to accomplish the goals.
For EPA, the case for change will likely be motivated by the widening disconnect between existing regulatory programs and current and emerging environmental problems; and by the need to control or mitigate fundamentally different kinds of sources (e.g., from large sources to smaller sources, point sources to non-point sources, and land use practices). Framing a compelling case for change precedes virtually all other actions by agency leadership in the context of innovation.

Senior agency leadership needs to ensure that annual budget requests “walk the talk” by ensuring that the proposed budget mirrors strategic priorities, including flexible funds for innovation (e.g., training, organizational and process experimentation and implementation).

**Background**
Creating and documenting the reason why change is necessary is an important aspect of change management. Ideally, the rationale should create incentives for change, explain why the status-quo is no longer functional, and outline a direction for change (Moore et al., 2002). The rationale for change creates a sense of urgency that must be sustained (Kotter, 1995). As a general rule, when roughly 75 percent of the organization’s management believes the status-quo is not acceptable, then the sense of urgency is sufficiently high to support change (Kotter, 1995).

**Summary of Findings**
This slide should be viewed in tandem with the slide on goals, measures, and priorities on page 23. Each of the organizations used clarified statements of goals and priorities as the foundation for change in culture, business processes, interactions with stakeholders, and budget and financial decisions.

Change occurred after experiencing serious disconnects between established processes and changes in the external environment. As a result, each organization developed a rationale as to why change was necessary, which included developing an updated primary mission statement. In the case of Customs and the FDA, the updated mission statement was initially perceived by some staff as a change in core values, which required extensive communication, persistence by senior leadership, and training to overcome.

- The VHA refocused its de facto mission from running hospitals for veterans to providing healthcare to veterans. In the past, safety was the sole objective driving management processes in the FDA. With the enactment of Prescription Drug User Fee Act (PDUFA) in 1992, consumer protection and public health became the driving forces for FDA management. This refocusing of mission encouraged a major change in FDA relations with industry. These “culture changes,” still controversial in some quarters in the FDA, require the fulfillment of obligations to protect public health, while managing a more cooperative, science-based interaction with industry.

- Customs moved from a mission primarily focused on protecting the U.S. from illegal trade to an organization that both protected and facilitated trade. Given this balancing of objectives, coupled with better information, compliance enforcement at Customs became focused on getting compliance rates up rather than on showing large numbers of punitive enforcement actions.
After the real estate crash and recession in the early 1990s, Marriott rethought its business model. Marriott International became a company that profited from selling expertise in managing room night sales, as opposed to owning and operating hotels. As a result, Marriott International focuses on transferring hotel management expertise to its franchises and assuring brand consistency and quality.

**Implications for EPA**

Congress and stakeholders were involved with each of the agencies’ transformations, but senior agency leaders (career and political) were key players – with their own priorities developed from years of working within the constraints of the status quo – that ultimately were folded into a larger political compromise. For agency-wide change to occur, senior leaders must take full ownership of the process and remain committed to its success.

**Background**

A clear, well-communicated vision or purpose will focus attention on innovative ideas. Employees must have a keen understanding of the organization’s purpose before they can suggest improvement. Because decisions made at all levels within the organization contribute to the success or failure of innovative ideas, a clear vision or mission statement reduces the need for lengthy debates on every decision (Collins and Porras, 1997; Dow and Cook, 1996; Kotter, 1996; Resetar et al., 1998).

A robust plan identifies the measures of success as well as organizational, compensatory, personnel and other barriers (including anticipated resistance) to full implementation of any major change. A robust plan also identifies those responsible for overcoming the barriers. Other features of the plan include measures to track progress and to ensure accountability for achieving success (Moore et al. 2002).

**Prepare for Change:**

**Action Plan**

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<tr>
<th>Action</th>
<th>FDA</th>
<th>VHA</th>
<th>Customs</th>
<th>DuPont</th>
<th>Marriott</th>
<th>P&amp;G</th>
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<td>Create an action plan</td>
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<td>Set clear organizational priorities and goals</td>
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<td>Keep change simple and focused</td>
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<td>Change enough to ensure that new organization is internally consistent</td>
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<td>Do positive, not negative, control change</td>
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**Summary of Findings**

This chart emphasizes that leaders in each of the organizations studied and actively managed innovation. They created action plans, set clear goals and priorities, stayed focused on their mission, and made the necessary structural changes to implement their plans. Action plans need to be pragmatic and credible within the ranks of senior management if they are to be successfully implemented. The Customs Service Day One exercise is one example of an action plan. The VHA, led by Ken Kizer, initiated an intensive planning process of several months duration that led to Vision for Change: A Plan to Restructure the Veterans Health Administration.

**Implications for EPA**

The public sector case studies demonstrate convincingly that senior leadership needs to make a full, public commitment to change and align their decision-making and resources to reinforce their message, whether within a region, a media office, or the Administrator’s Office.

**Background**

Most of the discussion on culture, or the environment to promote innovation, focuses on two aspects: the role of leadership in communicating the importance of innovation, and the values and norms that influence an individual’s behavior. It is the role of leaders within the organization (leaders include a mix of leaders by title and by reputation for skill, expertise, or respect) to make sure that every member understands the core
mission, the vision and the role innovation plays in the enterprise. Through action and words, leaders place value on innovation and challenging the status quo. Values and norms that typically are associated with innovative organizations are inquisitive natures, teamwork, information sharing, problem solving, risk taking, openness to new ideas, and persistence (Prather and Gundry, 1995).

There are many ways to create values and norms associated with innovative organizations. Because developing truly innovative ideas requires a systems view of the enterprise, much of the literature recommends using cross-functional teams to problem-solve. Cross-functional teams are a way to break barriers created by stove-piped functional organizations or mindsets (Kanter, 1997; Kotter, 1996; Majchrzak and Wang, 1996). These can be formal teams, charged with the responsibility to solve a specific problem, or formal or informal networks that operate on call. The formal organizational structure aligns units and staff to ease operations while the quasi-formal structure, which includes task forces or trouble-shooting teams, contributes to more rapid information sharing, problem sharing and adaptation to change (Tushman and Anderson, 1997). One of DuPont’s networks included scientists, product managers, and marketing specialists who would jointly solve problems presented to the network within 48 hours (e.g., what is the best material to use under a specific set of unusual service conditions).

Innovative companies frequently create internal competition that not only motivates, but provides recognition for good ideas (Kanter, 1997). However, not everyone agrees internal competition enhances innovation. Charles Prather, former creativity manager at the DuPont Center for Creativity and Innovation and currently of Bottomline Innovation Assoc., Inc., teaches that internal cooperation is much more effective than competition. Internal competition can be counter-productive if it rises to the level that stymies cooperation and reduces internal information sharing (Kohn, 1986).

Another contributor to innovative cultures is risk-taking. Leonard-Barton suggests two ways leaders can support risk-taking. The first is to distinguish “intelligent failure from unnecessary failure.” In this case, those involved in failed projects would not necessarily suffer damage to their careers, because failure was seen as a consequence of a desirable level of risk-taking. The second is to “recognize the role of failure in building knowledge.” In this case, information on failed projects is not buried, but incorporated into future experiments (Leonard-Barton, 1995).

<table>
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<tr>
<th><strong>Execute Change:</strong></th>
<th><strong>Formalize Process and Prototyping</strong></th>
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<tbody>
<tr>
<td><strong>Action</strong></td>
<td><strong>FDA</strong></td>
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<tr>
<td>Manage change itself like a formal project</td>
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<tr>
<td>Empower senior management teams to choose investments in innovation</td>
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<tr>
<td>Use pilots/prototypes</td>
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<tr>
<td>Maintain a formal scale-up process</td>
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**Summary of Findings**
Activities in this arena include, but are not limited to, innovation plans, scale-up processes, dissemination processes, and funding and resource allocation practices. The methods varied among the cases, but all put organizational structure and accountability tools in place to make sure that the change was implemented successfully. Most important, prototypes and pilots were not ends in themselves but vehicles for testing ideas that the agency intended to implement at full scale.

- The DuPont case provides the most complete picture of a structured innovation process. Technology officers at DuPont develop an Innovation Agenda and a ten-year technology plan. The Innovation Agenda identifies the big problems while the technology plan presents technology options over a 5 to 10 year time horizon to address the elements of the agenda. DuPont also uses two structured innovation processes, Apex and Product and Cycle-Time Excellence®, depending on the level of change desired. DuPont also found that for breakthrough innovation funding should come totally from the CEO.
Customs makes extensive use of the formal business process improvement methodology as well as prototyping for every facet of its operations. Congress endorsed the use of prototyping and evaluation as a means of testing new procedures before full implementation. One of the most important prototypes was the National Customs Automation Program (NCAP), designed to “demonstrate a fully electronic process for release of cargo, the collection of import data and duties, and supports the critical elements of the Modernization Act and business process redesign, such as account management and periodic filing (U.S. Customs Service, 2001).” In what was widely viewed as an initial successful experiment, three major automobile companies participated along with two other importers used NCAP and additional prototypes, with other sectors, are underway (1997).

In Marriott, new ideas that meet the test of improving some measured aspect of performance (according to the Balanced Scorecard approach) are diffused through the organization, typically beginning at the local level and then moving through Marriott’s regional network.

Implications for EPA
Implementation is typically the failure point in change efforts (Nadler et al., 1995 in Moore et al., 2002), and hence will require the greatest attention by EPA management. An accountable body of senior leaders is a recurrent theme as is their access to a dedicated funding stream, or in the case of Customs, Congressional support for the innovations.

Background
It is worth noting an obvious but nonetheless crucial point about change and external stakeholders in the public sector: “Organizations must be aware that innovation is risky. Courage is essential, a good public relations strategy is always a help, and preparing for the inevitable opposition is highly recommended” (Light, 1998).

Broad change is not likely to be implemented without the support of leadership from all involved stakeholder groups (Moore, et al., 2002). A coalition may be used to support change by identifying skills and training needs, providing resources, developing incentives, creating plans and designs, maintaining communications, spearheading changes in barriers in regulations, and organizational structures. The coalition should work with stakeholders to create and sustain support for change.

Education reform presents a relevant analogy to innovation in environmental regulation. Researchers at RAND have been studying the education reforms led by New American Schools, a nonprofit corporation funded by the private sector. They have found that while schools and school districts are motivated to try new approaches, for which there is no shortage, they do not have the incentives or resources to see these new approaches through to full fledged implementation. There are many reasons for this. For one, applying a new design to a specific school program requires curriculum development, planning time, teacher training and a host of other activities. Yet, school administrators generally have little discretionary funds available for these activities. Moreover, the discretionary funds that are available to a school often come from either the state or the district, whose priorities can shift before a new design approach is fully implemented (Bodilly, 1998; Bodilly, 2001). As a result, without performance standards or incentives, after three to four years, inertia sets in and teachers often work around the new initiatives. Teachers can quickly become disillusioned about reform after losing personal capital over several reform efforts (Bodilly, 2001; Glennan, 2001)
Summary of Findings

Supporting change requires the alignment of multiple elements. As evidenced by the density of dots on the slide above, the organizations studied by and large fully grasped this point. Financial resources must be in place and expected to remain so for the duration of the transformation or change process. Each of the organizations initiated training development programs to equip staff with the skills needed to contribute and function to the new environment. Leaders recognized the need to reward managers and staff who advanced the organization's objectives. This is particularly challenging in the public sector where personnel management tends to be more rigid. Finally, information management and new information technologies played an important role in supporting change in each of the cases.

Implications for EPA

As evidenced by the dozens of innovative strategies piloted over the last decade, the agency is willing to try new approaches. However, the internal challenge comes in providing the motivation and resources to diffuse and scale up promising innovations. The external challenge is developing a consensus with the states and Congress about the goals and bounds on innovation. These difficulties are non-trivial, and need to be carefully considered if the agency chooses to pursue their long-term innovation strategy and culture change agenda. Staff will watch for these actions as indicators of leadership's commitment to change.

Background

Like Procter and Gamble, BF Goodrich set up an “Innovation Fund” so that individuals across the company could apply for funding to turn a radical idea into something tangible. 3M uses “Genesis” grants to support workers as they initiate special projects not supported by the business.

GE has unallocated funds to support good ideas, short-circuiting the need to wait for the next budget cycle. General Electric is known for its “three generation” plans – thinking out ten years or so how its technology platforms, services, or initiatives will evolve through technology developments. The plan helps define projects to be initiated now to support longer-term developments. Prior planning at GE did not consider multiple product generations and as a result tended to be more incremental and cautious (Kanter, 1997). (The analogy holds for process improvements as well.)
As the final element of our study, we highlight actions identified in the case studies that may warrant further consideration by EPA. However, our study was limited to an analysis of characteristics and actions related to innovation by other organizations. We did not examine particular activities going on within EPA at this time, nor did we attempt to benchmark EPA offices or programs to the case study organizations. Thus, these options do not represent recommendations for specific actions, but rather represent the authors’ views – informed by the case studies – of a targeted set of choices that may warrant further analysis.

We have organized this section in two parts. The first part presents a simple way to frame decisions about whether to pursue various options and where an option would be most effectively pursued within the organization. The case studies demonstrate the value of selecting targets for change on the basis of the agency’s strategic priorities; there are also choices to be made with regard to the initial scale of implementation and the mode of change (i.e., whether it is incremental or more transformational). The model for change management presented earlier in the briefing provides a useful checklist of questions that address the agency’s readiness to plan, execute, and support change.

The second part of this section provides illustrations of options for selected core and supporting processes within EPA. We have singled out several cross-cutting, agency-wide elements like budgeting and human resources, as well as particular core functions and processes like permitting and regulatory and non-regulatory program implementation. Options for other functions and processes could be similarly developed.

The case studies deal with organization-wide change as well as more circumscribed change within particular functions. For example, the DuPont and P&G cases dealt primarily with the R&D process. Customs made changes in the compliance and enforcement function as well as operational information systems.

Outline

• Introduction
• Research method
• Case study analysis
• Findings across cases
• Options for EPA

Options for Change

• Select target(s) of change based on strategic priorities:
  – Scale
  – Mode: incremental vs. transformational
• Assess readiness to plan, execute, and support change
• Illustrate options for selected core and supporting processes

Choose Targets of Change

• Environmental problem (e.g. non-point sources, mercury)
• Organizational unit performance
  – Agency
  – Regional offices
  – States, tribes
  – Offices (e.g. Air, Water, OECA)
• Programs (e.g. TRI, NSR, Corrective Action)
• Process (e.g. permitting, planning, budgeting)
In the context of options for EPA, the target could be an environmental problem of regional or national scope. Alternatively, the target could be the performance of a specific organizational unit within the agency or the interface between the agency and a state or tribe. Targets could also be program- or process-specific. In fact, all of the above have been targets of past EPA pilots and innovative strategies. The point here is that the selection process ought to be set in the context of a change management model, which imposes a discipline on the choice of targets and assessment of readiness to implement change. The selection process ultimately must link to the strategic planning process in order to address the priorities of the EPA.

The scale of change can range from agency-wide actions like changes in employee performance assessment criteria to a single program within a single state. In between these two extremes are many options. Nonetheless, the basic ingredients of systems thinking about change management – prepare, support, and execute – are the same at any scale, although the level of control, effort, and public visibility may vary considerably.

The choice of the scale of innovation depends on multiple factors. As a threshold criterion, the scale of innovation needs to be large enough to observe outcomes that could guide subsequent decisions on scale-up. Other factors track important decision criteria embedded in the prepare-support-execute model for change management.

The case studies provide examples of both incremental and more radical change. The VHA and Marriott made major changes to their business model. DuPont and P&G changed their R&D function, but largely left the rest of their organizations intact. The FDA and Customs, with the blessing of Congress, undertook large-scale change in selected business processes while making more incremental changes elsewhere.

Practically speaking, EPA is at least several years away from major transformational change. However, numerous opportunities exist to pursue and learn from well-designed incremental changes, and indeed, some of these initiatives of this type are underway.
The representation of our change management model of prepare-support-execute is modified here to present a checklist for EPA staff to use as they make decisions about pursuing new innovations.

For example, EPA may wish to consider vesting a senior-level leadership group like the Innovation Action Council (IAC) with decision-making authority on experimentation. Their role would be to build a system of innovation and identify the resources required to fully implement it. The senior leadership group would translate broad mission priorities into innovation priorities, generating a new innovation plan or an update of an existing plan. This group could also be the focal point for business process improvement analysis. Similar to DuPont’s Innovation and Creativity Center, the senior-level group could work with human resources staff to identify training requirements and resources needed to implement them.

At whatever scale of change is contemplated, this step cannot be skipped or short-circuited. Preparation for change requires a clarity of thought about the problem to be solved, the motivation for change, the commitment of leadership, and the ability to measure and assess the value of innovation.

All three public organizations had a public good to offer in return for changes in internal processes that were causing difficulties for their regulated community or customers. This is what the VHA’s Ken Kizer called the “value proposition.” Kizer asserted that his radical transformation would lead to improved service for essentially the same level of public investment. FDA promised more expeditious new drug reviews in return for improvements in the quality of applications. Customs promised Congress that it would improve the processing of imported goods even as trade volume increased. EPA has yet to make a convincing case to Congress or the states that it indeed has a “value proposition” of the kind Kizer suggested to offer through innovation.

Another critical element in the preparation for change is asking the right questions. In summarizing innovative RAND research, Hillestad emphasizes the importance of making sure that the right problem is being solved by defining the target system and using empirical analysis to redefine the questions, alternatives, and critical assumptions. In consonance with systems thinking, it is important to develop a broad and deep understanding of the enterprise to determine how initiatives will further mission objectives (Hillestad, 2001).
Implementation of change is difficult, and tends to get the least amount of attention by management. Formally structuring the change process appears to work in both the private and public sectors. The cases offer several variations of a formal change mechanism with P&G and DuPont offering the best examples of structured processes. In each of these cases, implementation had several dimensions: special funding mechanisms, changes in employee incentives, networking, and organizational change. These separate actions were all “on message” and mutually supporting.

The situation is more complicated in the public sector where Congressional mandates frequently shape major agency change. Indeed, EPA’s existing structure is the embodiment of Congressionally directed change. To varying degrees, Congress allows agencies to fill in the details of their mandates. This is another reason why an internal change management system is necessary.

EPA might wish to consider a formal process for several reasons. First, the agency will need to provide the public and other interests with a full view of its rationale and process. Second, to be effective, EPA will need to work with states and firms in the regulated community. They will require transparency and certainty for the innovation to be worth their while to pursue. In a compliance context, EPA will need to fully comply with its own statutes and the Administrative Procedures Act if it intends to change existing regulations. Execution of change requires a feasible plan, a clear mechanism for decision-making and evaluation, and management accountability.

Scale-up is a particular type of change process that most organizations struggle to achieve. “Prepare” has multiple dimensions including the case for change, a vision of where an experiment might lead, senior leadership support, and a credible action plan. The “execute” phase requires a serious effort at measuring performance and building in feedback loops and check points to evaluate, adjust, or terminate experiments. Among the cases studied, each organization also had an infrastructure of actions and processes to support change management including prototyping and scale-up. These support services need to be in place to the extent possible before launching an experiment or some other change process.

In selecting ideas for prototyping, EPA senior leadership might consider a mixed portfolio of ideas to balance impacts, risks, and priorities. For example, high impact/high risk projects would be balanced with lower impact / lower risk projects (with more certain, albeit fewer, potential benefits); or, the innovation portfolio could be evaluated in terms of a matrix of priorities and impacts. Keying off the DuPont case, the EPA might consider two different innovation processes, depending on the level of change desired. More ambitious, system-wide innovations could be managed at the EPA headquarters level, while other innovations, especially those focused on process improvements and efficiencies, could be managed at the program or regional level.
with the headquarters role primarily to disseminate lessons learned from elsewhere in the agency and to encourage collaborations.

A senior-level leadership group could create a process for taking ideas forward before launching new pilots. This would clearly signal its willingness to seriously entertain a commitment to full-scale implementation if the experiment is deemed a success, and reinforce the point that the innovation management process is woven into key agency functions at all phases. In particular, the group must be able to fund and staff innovation projects. At the same time, it must be clear that some projects will be cancelled if they do not measure up.

Taking prototypes to the next level is challenging. (A wealth of RAND research has addressed scale-up issues in education and weapon system development, as summarized in Keltner 1997). For example, variability in local circumstances may mean designs are not universally applicable. Operational environments are not as controlled as prototyping environments. Therefore, new ideas may require some additional development before they are scaled-up. As prototypes are fully implemented, staff will need resources in the initial phases to learn new systems or procedures. The PACE process and public sector acquisition processes (such as defense acquisition), may offer some insights into how to structure this activity.

Customs has institutionalized the use of prototyping into most of their operations, including financial systems, information management, and enforcement and compliance. The best example is their experimental use of account managers to work with the largest importers. Their scale-up went from 10 account managers to more than a thousand over a several year period. They have established protocols for setting up experiments, identifying performance measures, and building in check points to assess performance measures and decide whether the experiment should be continued as is, expanded, or shut down. They also appear to have worked out arrangements with external stakeholders that enable them to selectively engage certain elements of their regulated community in these experiments.

Marriott has a decentralized process of innovation based at the hotel-level. Innovation from individual hotels is then spread through a regional network of similar Marriott properties before going national. The report gives several examples of these types of innovations (e.g., integration of welfare and partially disabled workers, cash management practices, use of the Balanced Scorecard to spread best practices). DuPont established a Creativity Center and other mechanisms to foster and support innovation including dedicated funding, focused management teams, knowledge networks, and employee incentives.

While the options listed above for supporting change are separate, they are mutually reinforcing. If implemented, these actions would infuse EPA staff with a clearer and more compelling reason to support transformation on the programmatic level as well as on a larger scale.

As each of the public organizations studied discovered, the alignment of large-scale innovation with mission ultimately required legislative change. None of the cases supported wholesale dismantlement of existing statutes. Rather, the changes were designed to advance the agency’s ability to better perform its mission, as agreed upon with stakeholders and Congress. In each case, agency leadership was proactive in defining the changes needed and in working with Congress and stakeholders to forge an acceptable compromise.
The following slides present options for a selected set of EPA’s core and supporting processes. The success of changes in core processes will depend in large measure on the agency’s success in aligning the supporting processes to reinforce the innovation. Actions taken to align supporting processes can make or break even the best ideas.

It is widely acknowledged that traditional forms of environmental regulation may not be the best approach for some future environmental issues such as watershed management, pollution prevention, climate change, and small source controls. A primary task for the senior-level leadership group is to build a portfolio of innovations to pursue from a select set of these examples and to develop project guidelines and evaluation criteria so the portfolio could be assessed on a consistent basis.

In the Customs, VHA, and FDA cases, the agencies made their arguments for legislative reform by identifying changes in the external environment that led to dysfunction, ineffectiveness, and often higher costs. In pursuing these discussions, agencies knew their own boundary conditions, and then negotiated with stakeholders on legislative change. They were opportunistic and built strong Hill support over several years.

The innovation process at FDA hinged on a new, Congressionally mandated funding mechanism. Industry fees provided the FDA with the resources to meet their new standards of timeliness in their drug approval process. In the case of Customs, Congress explicitly authorized new approaches to regulation (e.g., informed compliance), leaving Customs leadership with the latitude to design implementation processes.

Permitting is the primary mechanism used by the EPA to limit pollution generated by stationary point sources. It can be multi-layered, diffuse, and resource-intensive for the agency, states, and permittees. Industrial facilities typically have multiple air, water, and land-based waste sources within their control, and hence hold multiple individual permits from the state and/or the EPA.

EPA has control of important steps in permitting process. There are clearly opportunities for EPA to rethink the entire permitting process through something like the Customs Service’s Day One exercise. The point would be to ask fundamental
questions about what permitting is intended to accomplish and what might be the most promising options –
given today’s information and monitoring technologies – to accomplish its goals. Indeed, much of the work
has already been done by others (Davies et al., 2001).

Rethinking information flows in the permitting process might lead to development of new approaches to
compliance and enforcement practices and better alignment of resources. Borrowing from the Customs case,
account management may have some merit as an alternative organizing principle for the various and separate
permitting processes. EPA should be able to aggregate all permit data across media and facilities of certain
classes (company, sectoral code, and geography).

The FDA conducted a top to bottom overhaul of their new drug application process, focusing on what steps
could be done concurrently rather than sequentially, what information is needed at what point in the process,
and how the quality of technical review could be maintained in the face of time pressure. Similarly, EPA
needs to ask what kind of information it needs from permits to prioritize sources of environmental harm,
measure compliance with laws, and enforce laws; and how it can use information better to manage pollution,
improve compliance, and target enforcement resources.

The Marriott case presents an interesting analogy for EPA. Marriott’s franchise agreements look like both
permits and National Environmental Performance Partnership System (NEPPS) agreements with the states
(as they might be). The agreements specify numerical performance targets, compliance and reporting
mechanisms, and consequences of failure to comply. Unlike permits or NEPPS agreements, however, these
franchise agreements also include carefully structured incentives for both the franchised entity and Marriott
to perform at their highest level. Marriott is expected to deliver a set of services to help the franchisee
maximize profits. This is akin to EPA, at either the regional or headquarters level, providing states with technical
assistance, monitoring technologies, and program resources. The franchisee is expected to produce results
consistent with Marriott’s brand requirements. When both sides do their jobs well, they both reap rewards
and their constituencies are well-served.

Compliance and enforcement offer some of the
greatest opportunities for innovation, but also
present some of the most difficult challenges for
EPA. As with nearly all potential innovations,
evertheless, close collaboration with the states on
enforcement initiatives will be essential, given the
large frontline role played by the states.

The Customs’ example clearly demonstrates how
information technologies and better intelligence
gathering can be used to focus on raising levels of
compliance among lagging segments of the
regulated community, better allocate resources to
problem areas, and tailor enforcement strategies
to the particular features of a class of non-
compliers. However, to take full advantage of
these technologies, the agency needs to have come to some agreement on a suite of sound performance
measures that can be easily tracked and communicated.

More advanced monitoring technologies could play a critical role in this process, but EPA and Congress will
need to agree on whether sufficient incentives are in place in the major agency programs to spur the use of
more sophisticated information gathering. A recent GAO study (General Accounting Office, 2002) suggests
that these incentives are not in place. Information gathering by the states and EPA is largely prescribed by
federal environmental laws. Regulated entities do not have an incentive to report more information than the minimal required by the law. EPA’s challenge is to devise incentives to make improved information gathering worthwhile by rewarding good stewardship and “beyond compliance” performance. Rewards could take the form of reducing transaction costs by extending permit periods, allowing more flexibility to adopt innovative technologies, and third party certification.

Further, the Customs, FDA, and Marriott cases suggest the advantages of segmenting the regulated community to better address specific compliance and enforcement issues. Customs has moved to an account-based approach to compliance. Further improvements in their information systems will allow even greater use of this management approach. Marriott has raised the market segmentation strategy to a high art form by developing a thorough understanding of their different customer classes and the consequent differences in services required to satisfy them.

EPA has already taken modest steps in the direction of differential compliance strategies – largely directed to the “beyond compliance” class of performers, but it is likely that this too is an area where targeted legislative change may be necessary.

Finally, Marriott and Customs are walking the same line that EPA must walk between adherence to standard procedures and the occasional need to solve problems outside the box of standard practice. Both of these examples warrant closer study, particularly in the means by which the balancing act is communicated to frontline employees and stakeholders.

The Office of Environmental Information (OEI) is intended to provide an organizational focus within EPA to set future directions in information technology and management. OEI may wish to take a closer look at the examples of information-led innovation at Customs, Marriott, and DuPont.

The Customs case presents the most dramatic example of organizational transformation catalyzed by information technology. Customs’ ability to aggregate and analyze individual transactions across the individual ports opened the door to account-based management of compliance and enforcement of import rules. EPA faces a similar challenge with separate permitting and data bases created and maintained by each of the individual program offices – in the absence of a unified architecture.

Marriott’s far-flung enterprise required full integration of all support functions. Marriott makes extensive use of the web to provide management services to franchisees. In addition, it has pioneered the use of web-based training for a rapidly changing, multi-lingual workforce. EPA’s website continues to be a varied collection of offerings from individual offices. The Marriott example is a useful template of a fully integrated site for staff and partners.

DuPont made extensive use of an intranet to improve internal communications and information sharing among its worldwide units.
Besides its obvious influence on resource allocation, budgeting has become the primary forum for federal agencies to conduct their strategic planning and programming. For an innovation strategy to take root and become integrated into the standard operations of the agency, procedures for budgeting for innovation need to be developed and implemented.

EPA has some control of its own budgeting process, but ultimately must answer to OMB and Congress. Given the long lead times and other vagaries of the process, EPA should consider structuring a sustainable yet flexible funding mechanism to support pilot studies, and when justified, the next stage of implementation.

Budgeting issues should be thoroughly considered before commitments to additional pilot studies are made.

The case studies present several funding models. The use of performance measures in Marriott’s Balanced Scorecard and VHA’s VERA budget allocation system may be models for realizing the promise of NEPPS to improve the overall effectiveness of EPA and the states in delivering environmental benefits under budgetary constraints. DuPont and Procter and Gamble developed dedicated funding mechanisms and streamlined, transparent decision processes. The FDA substantially revamped their budget allocation processes to better support organizational realignment and innovation. In virtually all of the cases, a senior leadership group assumed control of the innovation process and associated budgeting requirements. This enabled them to effectively and credibly implement project selection and subsequent follow through on further development.

EPA’s special relationship with states and tribes is frequently cited by EPA staff as unique among regulatory agencies and a primary reason why organizational change within EPA is difficult. The implication is that change at the federal level must be closely coordinated with change at the state level and cannot be forced. By law and necessity, EPA and the states are full partners in environmental protection. In practice, the partnership can be adversarial and out of balance.

The cases present two options for modifying EPA’s relationship with states and tribes within the bounds of existing law. Customs created management centers to provide nationally-consistent administrative support to the 300 ports, and reduce substantial layers of redundancy and better focus administrative oversight. As suggested in NAPA (National Academy of Public Administration, 1997), EPA’s regional structure would benefit from a serious rethinking of its purpose and value added. The Customs model might have relevance if the regions were to be recast as primarily administrative support units.
A second option comes from the Marriott case. The Balanced Scorecard approach to franchise management has relevance to EPA’s own efforts to foster accountability and flexibility with the states through the National Environmental Performance Partnership System (NEPPS) (National Academy of Public Administration, 1997).

Changes in human resources practices are fundamental to culture change. Alignment of incentives and other changes often provide staff with the clearest signal of management priorities, and their absence can be a show-stopper. The case studies offer numerous examples of ways to encourage individual contributions. Marriott has demonstrated the ability to empower its associates to “problem-solve” on the spot if better customer satisfaction or hotel performance will result. DuPont found non-monetary ways to reward its research staff for innovation – for example, by providing improved laboratory environments – that had the further effect of making them even more inclined to innovate. The VHA used performance contracts with its VISN directors. Customs now engages in extensive training exercises after learning the downside risks of inadequate staff preparation and training earlier on in their modernization process. Customs also makes extensive use of employee recognition programs to further reinforce and connect individual performance with agency objectives.

In structuring these steps, the senior leadership group should address culture change, process changes, and incentives simultaneously. Contributions to innovations should be formally incorporated into performance appraisals with rewards to those who effectively collaborate with multiple offices. More extensive opportunities for staff development through rotational assignments would also reinforce the building of communities of practice and stimulate cross-office problem solving.

Leadership, clarity of mission and goals, internal communications, and responsiveness to external signals all consistently emerged from the cases as essential ingredients of success, whether change is incremental or more radical. Learning from the experiences of other organizations — positive and negative — in each of these areas has the potential to improve EPA’s prospects for a successful path forward on innovation.

Major transformational efforts take time. Depending on the scope of the transformation desired, and the organization’s size and complexity, it can take between three and seven years to fully implement change (Nadler et al., 1995). The message from each of the case studies is that organizational transformation is possible, but it is neither smooth nor linear. It is by definition a learning process filled with as many dead ends as new paths.
Lacking an organic statute, EPA is guided primarily by the mandates of individual pieces of legislation, no one of which is concerned with the vision, leadership, or performance of the entire organization. Consequently, the agency has lived most of its organizational life in a reactive mode, more focused on compliance with Congressional directives than in devising innovative approaches to improving environmental quality. External stakeholder and Congressional support for significant steps toward innovation in the agency will likely hinge on EPA’s success in articulating a clear and compelling mission statement and vision.

Another step on the critical path toward public consensus on the merits of innovation at EPA is drawing a clear connection between agency strategic priorities (presumably articulated in the agency’s strategic plan) and targets of opportunity for innovation. Tied closely to this step is the ability to measure the benefits of innovation in terms of their contribution to key strategic goals.

In the cases studied, productive change began to occur when the organizations took a few steps back from their status quo positions and asked themselves what business they were really in and whether their core processes were organized to further their mission. In each case, senior leadership played a critical role, but ultimately, the success of the transformation came from buy-in from the ranks of the organization. In each case, communications with staff during the course of change were essential, but not always handled particularly well (e.g., Customs).

In each of the cases, actions leading to innovation ranged from incremental to radical. The VHA transformation was by all accounts radical in its refocused mission and structural reorganization. However, smaller scale innovation proceeded after these larger changes were made. In contrast, Customs followed a more incremental path initially through its automation initiative, only to discover the potential and the necessity to envision much broader changes in its operations and structure.

It is also clear from each of the cases that systems of innovation were fully integrated with the core agency processes rather than existing as a disembodied front-office enterprise. As each of the cases shows, the degree to which this integration is accomplished sends a strong message to employees about the seriousness of the innovation effort.

Each of the cases illustrates how performance measures and goal setting can be used to manage the innovation and change process. Performance measures were vital in motivating the case for change, assessing the likelihood of success of prototypes, and communicating with stakeholders and internal audiences why innovation was deserving of investment.
BIBLIOGRAPHY


This report can be downloaded at no cost from http://www.rand.org/publications/DB/DB393.

RAND used a case study approach to provide examples of public and private sector organizations that had succeeded in becoming more innovated, and in the process, systematically developed “system for system change” to manage the change process. The logos on this page represent the organizational case studies described in the report on the Food and Drug Administration, the Veteran’s Health Administration, the U.S. Customs Service, DuPont, Marriott, and Proctor and Gamble.

Effective March 1, 2003, the U.S. Customs Service is no longer an agency within the Department of Treasury, but is now under the Department of Homeland Security as U.S. Customs and Border Protection.