United States General Accounting Office

GAO

Report to Congressional Requesters

December 1994

REENGINEERING ORGANIZATIONS

Results of a GAO Symposium

GAO/NSIAD-95-34

GAO

United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-258900

December 13, 1994

The Honorable Earl Hutto
Chairman, Subcommittee on Readiness
Committee on Armed Services
House of Representatives

The Honorable John R. Kasich
Ranking Minority Member, Subcommittee on Readiness
Committee on Armed Services
House of Representatives

As part of your request to review the philosophy and organization of the Department of Defense's (DOD) efforts to streamline its business practices, we conducted a symposium in June 1994 to address private sector best practices in reengineering. We briefed your staff on reengineering best practices, and as a result, you asked us to provide this report, which summarizes the key points made during the symposium. We will continue to obtain information on successful reengineering efforts in the private and public sectors and discuss our observations with consultants and academics who have studied reengineering concepts and practices.

Background

Although substantially reduced from Cold War levels, DOD remains the largest U.S. government entity. DOD employs about 3.5 million personnel with annual budgets ranging from $240 billion and $250 billion. Approximately $88 billion is spent on business activities to operate and maintain the defense infrastructure, including command and control, finance, material management, and human resources. Maintaining a strong national defense is dependent upon many factors. One of those is having a set of business operations that efficiently and effectively support the fighting forces. Today, there is great concern that efficiency and effectiveness improvements within the defense infrastructure are not keeping pace with those within the force structure. Furthermore, the National Performance Review is spurring DOD and other federal agencies to better serve its customers, empower its employees, and foster a more productive government. Reengineering represents one of many ways that allow DOD the opportunity to reduce cost and improve business processes, while providing effective support to the fighting forces. We describe business process reengineering in more detail in appendix IV.

Results in Brief

Five principles for effective reengineering emerged from the GAO-sponsored symposium. While these principles are not intended to be an all-inclusive list on how to effectively implement reengineering, they form the basis of a framework for bringing about the radical change required to reengineer business processes in a large organization. The principles reflect the panel members' views, which are not necessarily those of GAO.

- Top management must be supportive of and engaged in reengineering efforts to remove barriers and drive success.
- An organization's culture must be receptive to reengineering goals and principles.
- Major improvements and savings are realized by focusing on the business from a process rather than a functional perspective.
- Processes should be selected for reengineering based on a clear notion of customer needs, anticipated benefits, and potential for success.
- Process owners should manage reengineering projects with teams that are cross-functional, maintain a proper scope, focus on customer metrics, and enforce implementation timelines.

We provide more information on each of the principles in appendix I.

Scope and Methodology

We sponsored this symposium to obtain information on factors that lead to successful reengineering. We invited executives from five companies. The companies selected were cited in the literature or by experts as having successful reengineering activities. However, they do not represent a scientific sample of all companies that have succeeded in reengineering. We discussed the material presented by the panelists and its applicability to DOD with military consultants knowledgeable of DOD operations. (See app. III.) We also selected a moderator who had knowledge of the subject matter but no vested interest with the represented companies or DOD. A list of panel members is in appendix II.

We are sending copies of this report to the Chairmen, House and Senate Committees on Armed Services; other appropriate Members of Congress; and the symposium panelists and military consultants. Copies will also be made available to other interested parties on request.

This report was prepared under the direction of Donna M. Heivilin, Director, Defense Management and NASA Issues, who may be reached at (202) 512-8412 if you or your staff have any questions concerning this report. Other major contributors to this report are listed in appendix V.

Henry L. Hinton, Jr.
Assistant Comptroller General
National Security and International
Affairs Division

Contents

Abbreviations

DOD Department of Defense

Reengineering Organizations

Many private sector organizations have adopted reengineering principles to increase customer satisfaction and decrease operating costs by eliminating nonvalue-added activities. To do so, many companies have radically changed their ways of doing business. A detailed description of reengineering is in appendix IV.

The GAO Symposium: Reengineering Organizations

In June 1994, we convened a symposium on reengineering. We brought together executives from five Fortune 500 companies to get their input on the critical elements needed to achieve success through reengineering. The organizations selected were cited in the literature or by experts as having successful reengineering activities and do not represent a scientific sample of all organizations that have succeeded in reengineering.

The panelists and the organizations they represented were James D. Fischer, Corporate Headquarters Program Manager, Process Management, IBM Corporation; Joseph W. Joseph, Manager, General Motors Knowledge Center, General Motors Corporation; Joseph M. Matejek, Vice President of Reengineering, Aetna Life and Casualty Company; James D. Schoonover, Director of Integrated Operations and Vice Chairman of the Corporate Operations Network, E.I. duPont de Nemours and Company; and Gaye M. Williams, Senior Member, Technical Staff, Business Process Engineering, Bell Atlantic Corporation. Appendix II contains additional information on these panelists and their reengineering efforts. Dr. Astrid E. Merget, the Bantle Chair of Business and Government Relations at the Maxwell School of Citizenship and Public Affairs at Syracuse University, moderated the symposium.

Several military consultants present at the symposium expressed their opinions on reengineering within the Department of Defense (DOD). This report, however, focuses on private sector trends in reengineering.

Symposium Results: Reengineering Principles

Five principles for effective reengineering emerged from the symposium. While these principles are not intended to be an all-inclusive list on how to effectively implement reengineering, they form the basis of a framework for bringing about the radical change required to reengineer business processes in a large organization. The principles reflect the panel members' views, which are not necessarily ours.

Five Principles for Effective Reengineering:

1. Top management must be supportive of and engaged in reengineering efforts to remove barriers and drive success.
2. An organization's culture must be receptive to reengineering goals and principles.
3. Major improvements and savings are realized by focusing on the business from a process rather than a functional perspective.
4. Processes should be selected for reengineering based on a clear notion of customer needs, anticipated benefits, and potential for success.
5. Process owners should manage reengineering projects with teams that are cross-functional, maintain a proper scope, focus on customer metrics, and enforce implementation timelines.

Principle 1: Top Management Must Be Supportive

"Top management must drive reengineering into the organization. Middle management won't do it." -- Joe Matejek, Aetna

Committed and engaged top managers must support and lead reengineering efforts to ensure success. This is because top management has the authority to encourage employees to accept reengineered roles. Also, top management has the responsibility to set the corporate agenda and define the organization's culture and the ability to remove barriers that block changes to the organization's corporate mindset. The panelists agreed that a lack of top management commitment and engagement is the cause of most reengineering failures.

Top management engagement does not mean that the chief executive officer has to lead reengineering or that senior executives should manage all aspects of the reengineering effort. As Gaye Williams pointed out with a quote from futurist Joel Barker, "You lead between paradigms, and manage within paradigms." Senior executives play a leadership role in the process management paradigm by effecting cultural change and removing

barriers, while the process owners (line management) are responsible for managing or actually redesigning the work processes.

The distinction between leadership and management is demonstrated by the experience at Bell Atlantic. Top management was fully engaged in the efforts and regularly met with reengineering teams. However, rather than being involved in the minutiae of redesigning the processes, top management used its power to remove the barriers confronting the functional managers who were trying to redesign along process lines. Responsibility for redesigning the processes was left to teams that understood the core processes.

Principle 2: Culture Must Be Receptive to Reengineering

> "To be successful, reengineering [needs to be] embedded in the fiber of our people until it becomes a way of life." -- Jim Fischer, IBM

Symposium panelists said that one of the most important aspects of successful reengineering is having a corporate culture consistent with reengineering principles. The panelists stated that a culture receptive to reengineering accepts the premise that corporate success in a globally competitive environment requires that companies understand and respond to the needs of their customers. Joe Matejek summed up this idea by saying that their customers are "putting [our organization's] feet to the fire," expecting "the same or better service as in the past" for less cost. Failure to do this will ultimately result in loss of business. The panelists also added that a culture receptive to reengineering requires that business move beyond models of functional work organization to those of a process orientation. Without a compelling and well-communicated vision of where reengineering will take the organization, suspicion and mistrust can prevail. In this type of environment, reengineering should not be undertaken.

One cultural belief that fosters reengineering is that marketplace success is based on the ability to respond to customer needs. Our panelists stated that this is best accomplished by defining the organization's customers, determining their needs, and being equipped to fulfill these needs. Defining the customer is not easy, but it is a necessary first step. Once the customer is defined, several techniques are useful in determining customer needs. These include customer surveys, focus groups, and market trend

analyses. Fulfilling needs requires communication throughout the organization and an environment that promotes and reinforces an orientation toward customers.

Another cultural belief that fosters reengineering involves moving from functional to process management. According to Jim Schoonover, success in process management requires a "holistic" view of the business. This requires viewing the business across functional lines and focusing on customer needs. This is a complete redefinition of the way organizations traditionally perform work.

Our panelists emphasized the importance of communication in focusing the culture on reengineering. Reengineering goals should be communicated and explained consistently at all levels in the organization. This kind of communication is especially important in reducing employee skepticism and when corporate downsizing is forcing organizations to modify their covenants with their employees.

IBM's experiences provide valuable examples of communication in the process of framing the organization's vision and adapting the culture. IBM had to reengineer in response to a major financial crisis. The crisis affected IBM's ability to maintain its full employment policy. However, in its employee communications, IBM did not allow reengineering to become a euphemism for layoffs. IBM stated that reengineering was necessary in order to remain productive with fewer people and to meet employee and customer needs. IBM's Jim Fischer said that management's honesty on these issues helped gain employee commitment to the new environment. According to Jim Fischer, when employees knew how they fit in the new organization, they were more likely to help in implementing change. Jim Fischer also stated that employees came forward to help because they saw reengineering as an opportunity to survive and grow with the business.

Our panelists also emphasized training as an important tool in focusing the culture on reengineering. Training in skills such as negotiation and conflict resolution is required to get employees to work across functions. As reengineering proceeds, training should be modified as necessary to best support the process and should be provided on a "just-in-time" basis so employees can understand and apply what they learn.

At General Motors, groups are encouraged to bring actual product or manufacturing redesign problems to reengineering workshops. While promoting learning through application, General Motors wants to ensure

that employees apply what they have learned and will continue the reengineering process through implementation.

While communication and training are vital to the success of reengineering, they alone will not be enough. To ensure that changes are internalized, the new assumptions stressing coordinated and cooperative efforts must become part of the corporate culture and system of norms. Doing this may require that incentives and rewards be tailored to encourage and reinforce desired behaviors.

Principle 3: Savings Are Derived by Focusing on Processes Rather Than Functions

> "The real value in reengineering is not within "towers." Real savings [occurs] when you can [perform] cross tower reengineering." -- Jim Fischer, IBM

The panelists agreed that major improvements and savings in reengineering efforts would come from focusing on processes that span across functions rather than within functions. DuPont's Jim Schoonover pointed out that reengineering that focuses on redesigning processes yields benefits 10 times as large as attempts to improve the operations within a functional area.

In their affirmation of the importance of process over function, the panelists commented on the role of information technology in reengineering. Panelists agreed that reengineering cannot be based on information technology. Aetna disregarded information technology in redesigning processes. According to Joe Matejek, requirements were determined and processes were designed first, and then systems people were tasked with developing systems to support the new processes.

Panelists also agreed that reengineering should not be framed by the capabilities of existing computer systems. Gaye Williams mentioned one organization that, despite substantial investments in information technology, was forced to abandon a portion of its information systems because it was no longer adequate for the needs of its redesigned processes.

As it is important to tailor information management around redesigned processes, it is also necessary to understand processes in relation to one another. Since processes are interrelated, it is important that a redesign

approach ensure that the effects and linkages to other processes are fully understood.

Coordination should take place not only when reengineering the activities within a process, but also when designing measurements. Such coordination will help assure that the activities and measurements are complementary. Bell Atlantic's Gaye Williams gave an example of how conflicting functional measures could drain the overall organization. She described a company where the sales department was assessed on how many orders it generated, while the manufacturing department was evaluated based on conformity to production projections. Although sales had generated more than enough orders to keep manufacturing busy all month, the manufacturing division shut down halfway through the month because, according to flawed projections, the company had already met its quota. The overall organization suffered because the metrics used to evaluate functional performance were not aligned with overall process or customer-related goals.

Success in reengineering requires fostering a sense of process orientation and a willingness and ability to view reengineering outside of functional "stovepipes." This process orientation can be fostered without regard to the organizational structure. However, reengineering efforts may result in improvements in organizational structure.

Principle 4: Processes Should Be Selected Based on Customer Needs

> "The process that is the most broken in its ability to meet the customer's needs [is the one that should be reengineered]." -- Gaye Williams, Bell Atlantic

Successful reengineering requires answering several basic questions. Why should the organization reengineer? What process or processes should be reengineered? How long should reengineering take? With regard to how long reengineering should take, Gaye Williams said, "How long you have is how long it should take. If you have an immediate, pressing need, scope and staff the effort to fit in that time window." The organization's climate surrounding such issues as culture, leadership, and resource availability will also help determine the answers to basic reengineering questions.

The panelists generally agreed that the most important reason to reengineer is to meet customer needs. This may mean cutting costs to

lower price, as it did for Aetna, or decreasing cycle times, as it did for General Motors. Panelists stated that internal considerations, such as increasing profits or determining capacity requirements, may drive reengineering efforts. However, they emphasized that reengineering in response to meeting customer expectations offered far more dramatic and compelling results than reengineering based on internal factors.

In an organization where the culture is properly positioned for reengineering, process and project candidates should be assessed on the costs and benefits anticipated. The costs of a reengineering project are the dollar value of the resources consumed; the opportunity cost of using the resources for reengineering as opposed to something else; and the human costs, measured in terms of organizational morale. The benefits realized for reengineering include increased customer satisfaction, decreased operating costs resulting from the elimination of nonvalue-added activities, and the resources saved by operating more efficiently. Costs and benefits of reengineering should be presented in terms of the same metrics that will be used to assess progress when the project is underway. "Quick-hitter" projects—ones with quantifiable benefits, little cost, and short implementation time frames—can be used to "prime the pump" for future reengineering activities. Pilot testing is also a useful tool, when possible, to build impetus for reengineering by generating benefits, making converts of skeptics, and providing lessons learned.

Principle 5: Process Owners, With Cross-Functional Teams, Should Manage Reengineering Projects

> "[I] cannot conceive of any organization reengineering everything at once. There has to be certain definable processes that [people] can get their arms around." -- Joe Matejek, Aetna

Once processes are selected, process owners must be identified. Ideal process owners are usually responsible for or affected by a significant portion of the process. Panelists stated that process owners should be respected, trusted members of the organization; firmly engaged in reengineering efforts; and actively recruited rather than assigned to their roles. Such people are more likely to attract team members that are willing to take the risks associated with reengineering. Process owners must be engaged in reengineering because they will be responsible for implementing redesigned processes.

Process owners are also responsible for recruiting and managing reengineering teams. Panelists stated that teams should be limited in size and composed of cross-functional membership. Critical mass for reengineering teams is 6 to 10 full-time members. Having too many members makes it difficult to get everyone together, while having too few members places limits on what the group can accomplish.

Reengineering teams should have cross-functional representation to ensure that the reengineering effort incorporates a holistic view of the business. It is sometimes appropriate to include information technology people on the team, as they need to understand the processes they will be designing systems to support. Where applicable, union representation is encouraged to maximize buy-in and participation. Participation of groups with oversight or audit responsibilities would ensure that the new process fulfills legal and/or regulatory requirements. Panelists generally agreed that it is also useful to incorporate a person who knows nothing about the process to act as a catalyst, or a "yeast," to ask questions that make the experts rethink the process. Finally, it is important that team members are people who will be instrumental in selling the changes to others.

Consensus existed among the panelists that it is vitally important to clearly define the scope of the reengineering project. Although process reengineering must be done with respect to the whole, it is impossible to try to reengineer everything in a large organization at once. Therefore, the tendency to expand the scope—"scope creep"—must be avoided. Periodically, the defined scope of the project needs to be revisited to ensure the effort remains on course.

The results of reengineering should be assessed against metrics that have meaning for the overall organization and are customer-focused. Metrics that are financial in nature are not relevant in measuring process performance. While financial metrics can indicate a problem, customer-focused process metrics are required to identify causes and solutions. Whatever the choice of metrics, it is important to remember that the metrics should be representative of the expectations of reengineering in terms of activities and benefits and are tied to the overall goals of the organization. Metrics that do not add value to mission objectives are meaningless.

Project plans should be based on a set time frame, with management accountable for reaching the milestones. Joe Matejek of Aetna proposed the Aetna's 3-year model of no more than 6 months for redesign of a

process and no more than 2-1/2 years for full implementation from the end of the redesign. Time lines should be strictly enforced. One way to enforce implementation time lines is to fund the project only for the time allowed. At the end of the project's life, removing the projected savings from the process' budget allocation can serve as a powerful incentive to ensure that reengineering projects are fully implemented and that projected benefits are based on realistic assumptions. Management accountability is also vital in ensuring that implementation proceeds according to plans. Unless the leadership is as accountable as the employees, change will not occur. IBM changed its incentive structure for senior executives to hold the leadership responsible for change. Incentive pay for senior executives is now based primarily on IBM corporate performance rather than division performance.

The Challenge for the Future

Gains from reengineering will not be maintained if the vision and the supporting attributes in the corporate culture are not institutionalized. After the effects of reengineering are realized, continued efforts to improve reengineered process performance are needed along with efforts to keep abreast of customer needs. These continued efforts require the same degree of cross-functional team participation and senior management engagement as the original reengineering efforts. Finally, considering today's rapidly changing environment, it is possible, if not likely, that an organization may have to reengineer again to fulfill the future needs of its customers.

DOD's Director of Functional Process Improvement stated that the principles presented in this report could apply equally well to DOD as they do to the private sector. The director also stated that DOD has the added burden of extensive information sharing and interoperability requirements. He added that the real difficulty in DOD's reengineering efforts lies with implementation.

Military consultants present at the symposium stated that successful reengineering efforts at DOD will require involvement and engagement from the Secretary of Defense, with process ownership from uniformed military leadership. Because of the permanent nature of its leadership, the consultants proposed that the Joint Chiefs of Staff may be the organization in which to pursue joint approaches in managing defense business operations. The consultants also stated that DOD's current reengineering efforts should focus on a few key processes. However, the consultants pointed out potential barriers to reengineering. These barriers include the

rigidity in accounting and budgeting systems and the absence of rewards and incentives that encourage reengineering efforts.

Symposium Panelists

James D. Fischer: Jim Fischer is a Corporate Headquarters Program Manager of Process Management at IBM.

While process management efforts began at IBM in 1989, the real trigger to reengineering at IBM was an operating loss in 1993 of $8 billion. Like Bell Atlantic, reengineering at IBM is framed by response to customer requirements. One reengineering project involving manufacturing and services in IBM's parts logistics process has generated savings of $100 million. Reengineering has also helped IBM handle the reduction of its workforce from 400,000 to 250,000.

Joseph W. Joseph: Joe Joseph is the Manager of the General Motors Knowledge Center, which is part of its North American Operations Manufacturing Center.

General Motors was involved in process improvement work prior to moving into reengineering. General Motors has focused many of its reengineering efforts on design activities, which Mr. Joseph said can account for 70 to 95 percent of production costs. In Mr. Joseph's words, "the impetus behind reengineering was to stay in business." A 53-percent reduction in construction lead time and a 78-percent reduction in maintenance cost for a die cast tool design are examples of significant improvement.

Joseph M. Matejek: Joe Matejek is the Vice President of Reengineering at Aetna Life and Casualty Insurance Company.

Aetna is a 140-year-old, globally competitive firm. In the late 1980s, Aetna saw its market share drop, prompting extensive customer surveying and the use of focus groups to try to find the cause. The overwhelming finding was that consumers were primarily interested in price and Aetna was not price competitive. Therefore, Aetna's reengineering efforts, which started in 1990, have focused on cost reduction. For Aetna, employees equal cost, making it necessary to meet customer needs with fewer people. The workforce has been trimmed from 50,000 to 41,000. Further reductions will bring the total number of employees down to 38,000 by the end of 1994. Reengineering has resulted in a 25-percent cost reduction, while at the same time enhancing customer service. By the summer of 1995, Aetna expects to have reengineered all of its business processes.

James D. Schoonover: Jim Schoonover is the Director of Integrated Operations and the Vice Chairman of the Corporate Operations Network for DuPont.

DuPont began its work in the area of reengineering in 1988. By 1991 it had began to venture into integrated operations. In 1992, DuPont moved away from traditional functional organizations by eliminating departments and focusing on the value chains it provides to its customers. Mr. Schoonover characterized reengineering activities as "vital to DuPont's survival," with savings amounting to about $1 billion a year.

Gaye M. Williams: Gaye Williams is a Senior Member of the technical staff in Business Process Engineering for Bell Atlantic. Her responsibilities include high-level business process mapping, training on reengineering methodology, and facilitating process study and process improvement teams. Prior to joining Bell Atlantic, Gaye Williams was an Associate Director of Business Process Engineering at Texas Instruments.

In achieving success, Bell Atlantic has focused on reengineering its processes to better fulfill customer needs. Cycle time in filling orders for carrier-access service has been slashed, and error rates approach zero.

Military Consultants

Dr. Albert M. Bottoms (Retired, U.S. Navy Senior Executive Service): Dr. Bottoms has served as Science Advisor to the Commander of the U. S. Seventh Fleet and the Navy Chair at the Defense Systems Management College. He is currently a visiting professor of Undersea Warfare at the Naval Postgraduate School in Monterey, California.

Rear Admiral Rowland G. Freeman (Retired, U.S. Navy): Admiral Freeman had a varied naval career in operations and acquisition, including research and development management. He served as the Administrator of the General Services Administration under President Carter. He is currently a consultant in the international logistics area.

General Joseph J. Went (Retired, U.S. Marine Corps): General Went served 38 years in commissioned service. Following his assignment as Wing commander, he served as the Deputy Commander of Fleet Marine Forces Pacific; as the Deputy Chief of Staff for Reserve Affairs; as the Deputy Chief of Staff for Installations and Logistics; and finally, as the Assistant Commandant of the Marine Corps. He is currently a consultant on strategic planning for defense related industries.

Description of Business Process Reengineering

Business process reengineering is a management technique for achieving dramatic improvements in cost, quality, and customer service by making fundamental changes in the way an organization defines its mission and performs its work. Business process reengineering is based on a thorough understanding of an organization's customers, their needs, and the environment. Business process reengineering is focused on improving business processes that create and deliver value by satisfying the customer's needs. Generally, these processes cut across functional, geographic, and organizational units.

Business process reengineering is typically characterized by

- a top management-driven effort to challenge the current organizational mindset to one that is more receptive to customers and the environment;
- identifying and analyzing core business processes;
- applying cost/service/quality measures to determine how effectively they are meeting customer needs; and
- making systemic changes to the organization's structure, culture, roles, and responsibilities in order to support reengineered processes.

Major Contributors to This Report

National Security and International Affairs Division, Washington, D.C.

David R. Warren
Nomi R. Taslitt
Diane Blake Harper
B. Scott Pettis
Arnett Sanders
Jeffrey M. Stagnitti
Marilyn K. Wasleski

Ordering Information

The first copy of each GAO report and testimony is free. Additional copies are $2 each. Orders should be sent to the following address, accompanied by a check or money order made out to the Superintendent of Documents, when necessary. Orders for 100 or more copies to be mailed to a single address are discounted 25 percent.

Orders by mail:

U.S. General Accounting Office
P.O. Box 6015
Gaithersburg, MD 20884-6015

or visit:

Room 1100
700 4th St. NW (corner of 4th and G Sts. NW)
U.S. General Accounting Office
Washington, DC

Orders may also be placed by calling (202) 512-6000 or by using fax number (301) 258-4066, or TDD (301) 413-0006.

Each day, GAO issues a list of newly available reports and testimony. To receive facsimile copies of the daily list or any list from the past 30 days, please call (301) 258-4097 using a touchtone phone. A recorded menu will provide information on how to obtain these lists.

United States
General Accounting Office
Washington, D.C. 20548-0001

Bulk Mail
Postage & Fees Paid
GAO
Permit No. G100

Official Business
Penalty for Private Use $300

Address Correction Requested