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# **A Successful Case of Information Management Reengineering in the Government Sector**

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## **Abstract**

*Business Process Reengineering (BPR) provides organizations with a valuable tool to assess business processes. It can help to reduce costs and improve quality, customer satisfaction and productivity. Business Process Reengineering is most successful when coupled with targeted use of Information Technology in designing new processes. This paper presents a case of BPR at the Environment Safety and Health Division of Los Alamos National Laboratory. The case illustrates the success and benefits of BPR in an organization of the federal government. The case demonstrates the need for developing strategic processes, a "toolbox" of solutions to attack corporate-wide information management and tactics to address organizational obstacles.*

## **Introduction**

Los Alamos National Laboratory is operated by the University of California for the US Department of Energy. The original mission of the Laboratory was to develop the first atomic bombs during World War II. In recent years the stated mission has evolved to providing the technical foundation to reduce the global nuclear danger to ensure a more secure future for the nation. Los Alamos National Laboratory (LANL) employs approximately 12,000 people in support of its \$1B annual science and technology mission.

The Environment, Safety and Health (ESH) Division is one of the twenty seven Division and Program Offices LANL. The ESH Division employs approximately 800 personnel who provide technical support services for environmental protection, industrial hygiene and safety, occupational medicine and epidemiology, risk management, operational assurance, and radiological protection. Operationally the ESH Division is divided into sixteen organizations with a combined \$90M annual budget. The ESH Division is both a heavy information creator and information user. The Division infrastructure includes approximately 2000 desktop computers and forty information servers (e.g., file, database, communications) that are connected across LANL's forty-three square mile campus by TCP/IP-based networks.

## **ESH Division Reengineering**

Like most government-funded agencies, the Los Alamos National Laboratory has faced major budget pressure over the last decade. In January of 1995, the management of ESH Division embarked on a process to reengineer the division in order to better meet the needs of its customers. Division management analyzed a number of processes as possible candidates for reengineering. By April of 1995 three processes had been selected for reengineering: service delivery, performance measurement, and information management. Training in the Hammer Business Processing Reengineering (BPR) methodology was provided for the Division's management team. By June of 1995, process owners were selected and the process reengineering teams were chartered and trained. Team solutions were presented to the Division Director in

August of 1995 and then communicated to Division personnel. October marked the beginning of the implementation phase for process solutions recommended by process teams.

### **The Information Management Reengineering Process**

Information management was chosen as one of the initial processes because of its potential impact as an enabler of other processes across the Division. The Information Management System (IMS) Reengineering Team was formed to improve operational efficiency and customer satisfaction through the application of modern information technologies. The team's charter was to reengineer information management processes across ESH Division. Designs were to provide a map for the implementation of a flexible and comprehensive information system for all of ESH Division.

The IMS team initially focused on the flow of radiation data in order to keep immediate objectives achievable. This information was seen to be highly representational of other information sets in the division because it spanned organizational boundaries, existed in all traditional forms, and supported a \$35M per year program. To further refine the task, the team examined data management, document management, records management, and infrastructure management processes with both vertical (single information stream applicability) and horizontal (multiple information stream applicability) solutions as appropriate.

Twelve radiation data processes were identified and analyzed. Interviews were conducted with a total of forty-five customers, both internal and external to the Division. The information collected showed that customers had several overriding concerns with regard to radiation data provided by ESH division. These included timely data access, data integrity, redundant systems, and inefficiencies in the processes which collect, archive and retrieve operational data.

### **Recommendations**

Several architectural issues were analyzed by the team. The first involved data storage and data processing strategies incorporating both centralized and de-centralized information management. Proper management of any proposed system was found to require some components to be centralized and others to be decentralized. Connectivity management would need to be centralized. Management of data in a specific database, documents, and manuals could be decentralized and managed at the work unit level. Cost tracking was found to require centralization. Finally, the team recognized a critical need to implement and maintain a modern information infrastructure to ensure the support of new processes and their supporting technologies.

Solutions endeavored to avoid creating data in paper form wherever possible. Recommendations addressed issues which would enable process owners throughout the division to make use of technology to streamline tasks. Data was to be archived in network accessible electronic format to promote analysis and reuse and to reduce redundant data sets. Document and record processes would migrate towards the use of an electronic workplace for creation, editing searching, retrieval and general distribution. Standards and procedures for information systems within ESH division would need to be developed to address data ownership issues.

### **Results of BPR**

Less than thirty percent of the ESH Division had network connectivity when the Division launched on its reengineering effort in 1995. Many different and varied database tools were used to store and report customer information. In the last fourteen months, the Division has achieved one hundred percent network connectivity and procured a division-wide relational database product suite to standardize data management. The Information Management Systems reengineering effort has addressed both vertical and horizontal business processes achieving measures of success in several information processes. Seven processes have been reengineered to date. The processes and their results follow:

**Routine Radiation Survey Data System:** This is a vertical data process that collects, analyzes and archives more than a million data points per year. The solution applies bar code technology, adds computers and memory to the radiation instrumentation used in the process, collects the information into a relational database through network connections, and then produces reports using simple applications including automatic generation of survey maps. The business results include a factor of 2 reduction in the resources used to execute the surveys, a factor of 2 reduction in the resources required to meet reporting requirements, and a factor of 11 decrease in the number of procedures required to execute the process. The pilot is complete, has been accepted, and this process is moving to deployment.

**Radiation Smear Survey Data System:** This is a vertical data process that collects, analyzes and archives more than a million samples and associated data points per year. The solution applies pen computers to the collection of field data, uses networks to transfer data to and from laboratories for analysis, collects the information into a relational database through network connections, and then produces reports using simple applications. The business results include >factor of 2 reduction in the resources required to meet federal reporting requirements and a factor of 10 or greater decrease in certain process cycle times. The pilot for this system is complete and undergoing the acceptance process.

**Project Hazard Analysis System:** This is a vertical data and document process that analyzes the hazards associated with >300 proposed science projects each year. The solution applies relational database, email, and web technologies to create an electronic workplace document review and comment system that supports virtual work teams. The business results include a factor of 4-6 reduction in costs and a factor of 2-4 improvement in cycle times. This system is now in production.

**Radiation Instrument Tracking System:** This is a new vertical data process that tracks the location and readiness of >6000 radiation measurements instruments. The solution applies relational database and web technologies to allow real-time tracking of the instruments. The business results include reducing instrument search and location times from weeks to minutes. This system is in the process of being deployed.

**Data Access and Delivery System:** This is a new horizontal data process that provides reports and general access to institutional data that is in electronic form. It is designed to replace numerous document processes where paper reports were request by phone and subsequently transmitted by mail. The system uses web and database technology to provide direct desktop access to requested reports. The business results include a factor of 10-20 reduction in the report delivery cycle. This system is in the process of being deployed.

**Electronic Records Management System:** This is a horizontal records process that is designed to improve operation of the >700 record series in ESH Division. The solution applies document management applications, full-text databases, imaging and OCR technologies, and web-based interface systems to migrate record management into the electronic workplace. The business results for the pilot projects are not yet compiled.

**Web-Based Assessment System:** This is a horizontal data and document process that is designed to replace paper-based assessments and surveys. This solution applies relational database technology, web interface systems, and standard desktop analysis and word processing technologies to allow users to create, distribute and analyze surveys, assessments, and other similar information collection and testing instruments. This system is presently in the pilot project phase. Cycle time reductions of a factor of ten or greater are expected.

Other systems under development include: organizational communication, document management, customer interface, issue tracking and a new work control system.

## Conclusions

A number of conclusions have been reached thus far into ESH Division's information management reengineering. First, IT can be applied more rapidly and with clearer benefits where operations have more clearly defined processes. This may or may not be where the potential for greatest benefit lies. Second, a 'toolbox' of IT solutions is required to attack corporate-wide information processes. This is particularly true when a process-oriented breakdown of corporate information (data, documents, records, infrastructure) is used. Third, people issues dominate the timeline. This is most noticeable where jobs are at risk of being changed. In these cases progress is especially slow due to the many possible levels of organizational resistance. This resistance is compounded by the fact that the perceived value of the changes is very individual in nature. Similarly, integrating processes across multiple organizations adds to the time requirements due to the alignments and changes required in the different organizations. Fourth, shifting people from supporting old systems to supporting new systems without compromising production can be a major obstacle. This can easily create a situation where maintenance costs can exceed available resources without careful design and patient implementation. Fifth, corporate desktop standards greatly reduce the complexity of new information system design as well as reducing the implementation costs associated with end-users.

Finally, it is possible to conclude that basing BPR solutions around information technology greatly improves the probability of favorable and measurable business results. Of the three Division processes being reengineered, the information management effort is the only one demonstrating clear positive results. The performance measurement solution was organizationally based and has not yet been implemented. The service delivery solution, also organizationally based, has been partially implemented and resulted in a 50% increase in the utilization of the preferred process, but financial and performance success have not yet been demonstrated.

*References available upon request.*