

Materiel Management Reengineering: Value Creation through Innovation

By reengineering their department's core processes, materiel managers can expand their role in the health care setting while realizing significant cost savings. Using a team model, Inova Health System materiel management staff integrated their processes for vendor selection, purchasing, inventory reduction, and utilization across three hospitals and ancillary services. An integrated approach at all levels of the organization gained buy-in from administrators and staff systemwide. *Key words: cost reduction, multidisciplinary, outcomes, reengineering, standardization*

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AS SHRINKING revenues and shifting patient populations have left hospitals scrambling to reduce their direct costs and overhead, materiel management has been a primary target for budget slashing and downsizing. All too often the imperative is for a short-term, quick fix—"We must find \$x million in cost savings by the end of this year and materiel management's share is \$y"—forcing the materiel management director to implement whatever expediencies will get the job done fastest. But the experience of Inova Health System, an integrated delivery system with three acute-care hospitals in the Northern Virginia suburbs of Washington, D.C., has been different. The lesson learned? That taking a *reengineering* approach to such changes will yield even greater cost savings over the long term and achieve an even more important end: to radically reposition materiel management as a key partner with direct caregivers in cost containment, quality improvement, and customer satisfaction throughout the system.

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In 1994, like other hospitals and health care systems, Inova Health System was coming to grips with the need to streamline materiel management operations and to bring them in line with the emerging requirements of managed care. We were not driven by an urgent need to avert an imminent budget shortfall through immediate and drastic action, and we were fortunate enough to have senior executives who understood and embraced the concept of reengineering in health care service delivery. Given these positive circumstances, materiel management professionals at Inova were able to rethink materiel management for the managed care environment. With the help of experienced consultants, an Inova team headed by a full-time initiative leader took a fresh look at the entire materiel management system.

THE BACKDROP TO INOVA’S MATERIEL MANAGEMENT REDESIGN

For Inova, as for most health care providers, the emergence of managed care has led to shrinking reimbursements, fewer admissions, shorter patient stays, and a shift from viewing expendable resources such as surgical and medical supplies and pharmaceuticals not as charges generated but as costs incurred. By early 1994, managed care was well on the way to becoming the dominant force in Northern Virginia health care economics. Inova and its three not-for-profit hospitals—656-bed Fairfax Hospital, 160-bed Fair Oaks Hospital, and 235-bed Mount Vernon Hospital—were well managed and fiscally sound, but senior-level management knew that the situation was in transition.

Inova, like many other multihospital systems in the early 1990s, had historically been very much a decentralized organization. Despite Inova’s desire to help its three facilities benefit from their considerable group purchasing power, materiel management at the three hospitals operated almost completely independently of each other, with separate leadership, separate staffs, separate warehousing functions, and separate inventory management processes. Furthermore, the status of the largest hospital, Fairfax Hospital, as a recognized regional leader with access to the lion’s share of Inova’s resources, tended to produce a sense of inequity. The smaller hospitals were apprehensive that their special needs and circumstances would not be addressed when systemwide processes were put in place. Add to this the proliferation of processes and departments affected by materiel management practices within the individual facilities and the result was a challenge of daunting proportions.

Nonetheless, Inova’s leadership recognized that materiel management presented significant opportunities for systemwide integration, with resultant cost-savings and economies of scale. Consequently, in mid-1994 Inova created an eight-member, cross-facility, multidisciplinary team to study the situation and recommend changes. To aid the team, Inova contracted with Coopers & Lybrand, a consulting firm whose expertise in process reengineering would provide an outside view and an organized approach for making change.

QUICK ASSESSMENT AND THE DECISION TO REENGINEER

With the assistance of Coopers & Lybrand, and using a quick assessment



process they developed, the team undertook an eight-week, up-front assessment of materiel management processes system-wide. The quick assessment was developed to identify the magnitude and complexity of the performance improvement opportunity at a high level. It found a situation long overdue for change. Replenishment processes across Inova, from identifying a need for a product to the product's delivery to the end user, lacked standardization and incorporated duplicative work steps, often requiring more than a dozen hand-offs and resulting in an estimated 50 percent non-value-added (wasted or redundant) time in the process. The total number of vendors involved exceeded 6,000, with prime vendor purchases comprising only 12.7 percent of total purchases. This is a far cry from the "best practice" of 1,200 to 1,500 vendors, with 75 to 80 percent of purchases going through prime vendors.

Such numbers indicated more than inefficiencies. The team identified the root causes of these problems as:

- multiple systemwide philosophies, practices, and contract compliance incentives;
- fragmented/nonexistent information systems;
- failure to use full capabilities of prime vendor relationships; and
- functionally driven processes and structures.

Issues like these could not be resolved merely by applying such materiel management improvements as automation and outsourcing. Outsourcing, for example, would not be efficient in such a fragmented environment. It would shift the responsibility to another partner but it would not help create a culture change that would lead to system

integration. Information systems only track what is happening; they do not make order out of chaos. Electronic data interchange only transmits orders and reports; it does not tell managers how to make the most of their buying power or how to manage their relationships with vendors.

The role of Coopers & Lybrand was to provide the outside view that forced us to face the need to articulate a vision. They challenged our basic assumptions about materiel management, encouraging us to reenvision materiel management as fundamental infrastructure supporting Inova's core competency: patient care. With their help, the team first made critical attitude shifts about materiel management—from thinking of it as "box kickers" to understanding materiel management professionals as the managers of resources that, if managed properly, contribute to patient, employee, and physician satisfaction, and improved clinical and economic outcomes.

From that perspective, we agreed that nothing less than total reengineering of the materiel management function systemwide would provide the right solutions. The investment of time and human and financial resources in the reengineering effort would be paid back amply, because well-managed materiel resources would add total value to the entire system through cost reductions and quality and service enhancements.

THE REENGINEERING PROCESS

Coopers & Lybrand introduced reengineering to the team as a means to radically improve performance and create sustainable competitive advantages by challenging and restructuring core business pro-

cesses using operational, technical, and business knowledge in a unified way.

To bring about such a reengineering of materiel management at Inova, we set up and moved through a redesign process that flowed directly from the initial quick assessment. That process included:

- setting up teams to plan and implement the redesign,
- taking a deeper look at the quick assessment results to validate the findings,
- developing a comprehensive analysis from the customer’s viewpoint,
- analyzing best practices,
- producing a new mission statement, and
- setting strategies for operations improvement.

Redesign teams

Getting the right people involved is a critical part of process redesign. After the initial quick assessment, we designed a team structure to capture process users’ and customers’ knowledge and involve as many Inova employees as possible. Central was a 12-member core process redesign team. This core team reported to Inova Health System’s operations council, made up of senior-level executives from across the system.

The core process team was assisted by five support teams. Each of the five teams had its own charter but pursued common project objectives. To assure that the support teams and the core team worked in concert, each of the five support teams was led by a member of the core team. The charters for each of the teams called for the following specific types of improvements:

- Core redesign team: To design and implement new process capabilities.

- Inventory management: Pilot new inventory management strategies and practices.
- Vendor relations: To establish and build prime vendor relationships.
- Product valuation: To evaluate product standardization opportunities across the system.
- Information systems: To evaluate enabling technologies and to provide technical support.
- Operating room resource utilization team: To develop a pilot process for reducing direct, nonsalary surgical procedure costs, to develop a systemwide philosophy and set of guiding principles for surgical inventory management, and to support efforts to implement consistently surgical inventory system applications systemwide.

Deeper analysis of initial assessment results

To gain a better understanding of the basic values and assumptions that led to materiel management’s current operational practices, the team took its quick assessment findings to a deeper level of understanding. This was a critical task in the process, given reengineering’s basic premise of challenging and changing values and assumptions to achieve higher levels of innovation.

A deeper look at customer needs

In Inova’s redesign process, the customer became the center of our core process mission: “To deliver an acceptable product to the right customer at the right time.” To carry out this mission in our day-to-day management of resources, we had to un-



derstand what the customer wanted and needed. That meant that the customer had to be an integral part of the redesign process. It also meant that we had to be willing to listen, rethink, and redesign processes that worked just fine from an administrative standpoint but did not meet the customer's needs.

Through a customer survey, we discovered that we needed to reduce the time clinicians spent procuring and managing nonlabor resources, to stage items so that they would be "ready to use," to standardize products and inventory management practices across the system, to provide greater access to information and systems, and to partner with clinicians to help achieve clinical and economic outcomes.

Best practices

When we took this step during redesign, we looked beyond our peer organizations in health care and studied best practices in comparable manufacturing settings. We also sought internal Inova examples of best practices, and we found them in many of our pharmaceutical subprocess activities. For example, contracting for pharmaceuticals is handled through a central database and complies with the Group Purchasing Organization. The procurement is handled through a systemwide prime vendor holding 85 percent of the business. Purchase orders are transmitted utilizing electronic data interchange. Deliveries are sent directly to the pharmacy from the prime vendor, without a need for hub distribution. Drug utilization is tied to cost and clinical outcomes, and emerging drugs are evaluated in terms of outcomes rather than by comparing costs with current formulary items. Pharmaceuticals are provided at

the point of service in a ready-to-administer form through SureMed, a drug ATM. The ultimate goal of the pharmaceutical care process is to have information from point of service utilization generate replenishment.

Mission statement

To bridge the gap between the current services and the customer expectations, the redesign team created a new mission statement that repackaged materiel management services into resource management services.

Resource management services will collaborate and share accountability to achieve improved clinical and economic outcomes. This mission will be accomplished by leading innovative procurement and logistics management services, providing decision support to link resource utilization with measurable outcomes, and identifying emerging products and technologies and positioning them effectively in the patient care environment. Resource management services will be organized to support key service lines and Inova's strategic initiatives.

The new mission statement was significant because it broadened the boundaries from managing supplies to resource management and tied it to clinical and economic outcomes. Resource management covered supplies, pharmaceuticals, equipment, instrumentation, service contracts, and construction.

Only after we had moved through all these activities were we ready to set our strategies for operations improvement. Conventional organizational change usually starts with changes to the organization chart, but reengineered change starts with vision, goals, and the pragmatics of what processes are meant to do. In our case, the crucial step was making the link

between materiel management and the core competency of Inova as a whole: caring for patients. This link, in turn, helped us recognize the importance of value, not just price, in the end results of process changes. As we moved to the stage of setting strategies, we were working from a common goal: to reengineer our processes so that they would contribute to quality, service, and timeliness, as well as to cost efficiency.

LONG-TERM OPERATIONS IMPROVEMENT

Over a period of two months, the core process team identified seven strategies for operations improvement. The strategies were to:

1. Create a systemwide philosophy and structure.
2. Build supplier partnerships.
3. Outsource noncore competencies.
4. Develop cross-functional processes.
5. Develop systemwide product valuation.
6. Integrate nonsalary resource management.
7. Develop new and emerging product valuation.

These strategies would drive the new materiel management function at Inova, just as a set of interlocking gears drives a machine (Figure 1). These strategies were intended to reflect the “voice of the customer,” assuring that customer needs and expectations would drive our operations. Further, they were designed to optimize key “process enablers” (information systems, human resources, and finance) to support our redesigned processes’ capabilities. The main driver of all strategies, however, was the fourth strategy—the development of

cross-functional processes. These processes, developed from the viewpoint not of our administrative needs but of what the *customer* sees in our operations, would focus us on providing customer-valued services.

Systemwide philosophy and structure

To create a systemwide philosophy and structure, we had to address the problem of having four materiel management budgets with multiple practices and philosophies. Within one year, we had a consistent, consolidated reporting structure and a systemwide materiel management leadership team. By the end of our five-year plan, we will have one materiel management budget, a single systemwide materiel management philosophy, and consistent service across Inova’s continuum of care.

Supplier partnerships

In building supplier partnerships, we had to start virtually from zero. As in many old-style materiel management functions, our relationships with suppliers were built on an adversarial model. Six months into the process, we had identified a prime vendor distribution agreement, identified prime manufacturers and vendor partners, and established a vendor certification program. The goal was to consolidate suppliers and reduce the number of suppliers to less than 2,000 and to consolidate distribution and make sure that 80 percent of all medical-surgical products are distributed through a prime vendor. Today, we have a prime distribution vendor who will have approximately \$23 million of business from Inova. Through that agreement, we gain freedom from managing large quantities of supplies in the Inova warehouse, and the

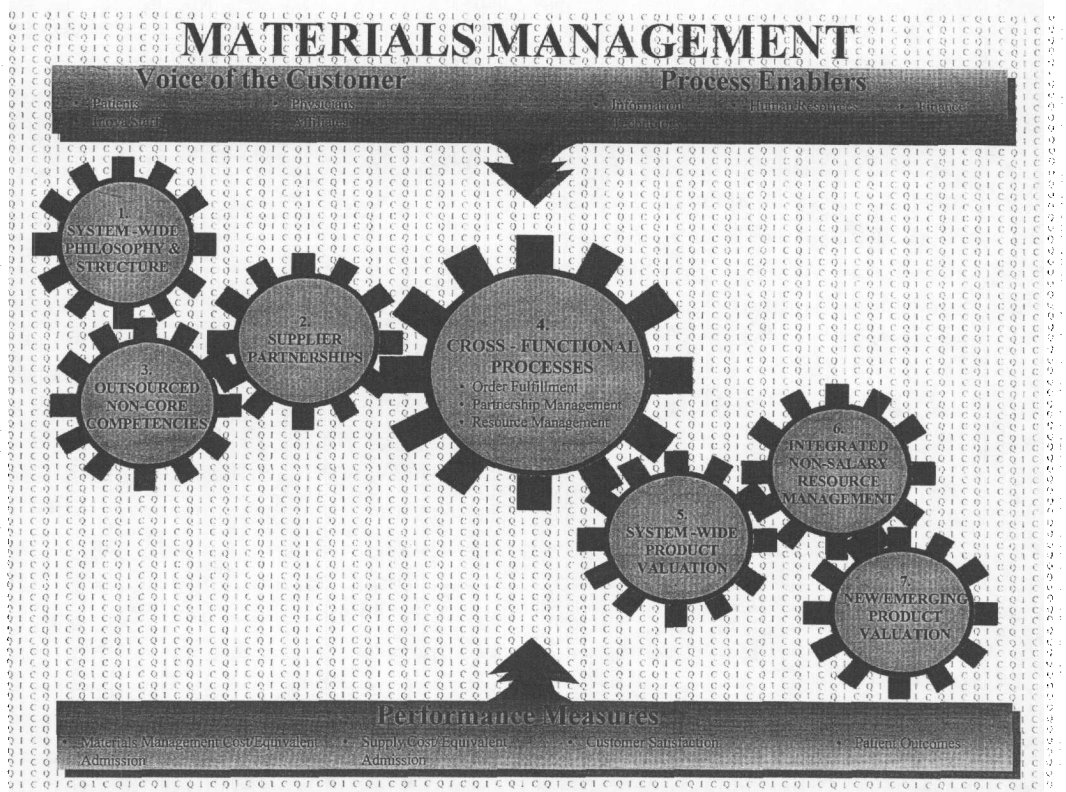


Figure 1. Seven strategies for operations improvement.

prime vendor distributor will deliver supplies in low unit of issue on a daily basis.

Outsourcing noncore competencies

Outsourcing noncore competencies will give us the ability to maximize service and quality and minimize cost. As we began our effort to outsource noncore competencies, we had one tremendous advantage: We knew exactly what our core competency was to be, through our visioning processes. Our core competencies are the service proficiencies and key skills required to support our primary business of patient care. Using this definition, we made our first decision: to fully outsource forms management at Inova. The prime forms vendor

has helped Inova create a twin-track approach to forms management. The first track involves streamlining the forms order fulfillment process, and the second track focuses on standardizing forms and improving the content and flow of documentation. In addition to the outsourcing activities developed through our prime forms and distribution vendors, Inova will continue to compare our service delivery capabilities with the external market to identify other outsourcing opportunities.

Cross-functional processes

A key part of our strategy to reduce the number of processes was to create cross-functional processes that would eliminate

multiple hand-offs in the replenishment process. From a traditional, functional structure built around six processes (contracting, purchasing, warehousing, receiving, distribution, and payables), we identified three cross-functional processes: order fulfillment, resource management, and partnership management.

1. The **order fulfillment function** includes a process that begins with a signal to replenish or with creating an order. A new information system, Enterprise Systems, was selected to bring electronic transaction capability and point-of-service order entry to Inova. Through Enterprise Systems, purchase orders, price catalogs, receiving, and invoicing can be transmitted electronically from Inova locations to the prime vendors.
2. The **resource management function** includes managing resources in terms of cost by product or pathway, through inventory utilization reports and emerging products information. It also includes evaluating resource utilization, identifying and implementing improvements, and ultimately sustaining improvements.
3. The **partnership management function** includes supplier certification, prime distributor agreement, and contract agreements. It involves determining the strategic and customer needs, defining and negotiating partnerships, measuring performance and providing feedback, and participating in joint problem solving.

Organizing and defining operations by cross-functional processes is taking a “customer view” of materiel management, which benefits department employees and customers because it increases understanding

of the end-to-end process, and it optimizes the value delivery to customers. The new processes are team driven, requiring empowered staff and the flexibility to accommodate exceptions without destroying the integrity of the process.

Develop systemwide product valuation

Systemwide product valuation strategy addressed the problem of multiple brand purchases and poor standardization. In addition to traditional product standardization through product committees, Inova has adopted two approaches focused on product lines and surgical procedures. The product line process begins with selecting a product line (e.g., anesthesia) and collecting utilization information by supply category. Next, we invite physician users to view the data as a team and to come to consensus on standardization opportunities. The surgical procedure process begins with identifying the surgical procedure, developing categories of resources such as medications, equipment, and supplies. Next, we gather data on the updated preference card for every physician performing the procedure and match the pricing with the resource lists from the preference cards. Then, we review information and identify savings opportunities and present a confidential profile to surgeons that shows their performance against their peers. The data is updated and reviewed every six months.

Integrated nonsalary resource management

The integrated nonsalary resource management strategy addressed the problem of separate, duplicative order fulfillment processes for equipment, instrumentation, supplies, pharmaceuticals, and other ma-



teriel. The first step to integrated resource management is to streamline activities through a central order fulfillment process. The second step is to create a capability for evaluating direct nonlabor resources consumed by specific patient populations.

Develop new and emerging product valuation

The new and emerging product valuation strategy addressed the issue of patient outcomes and satisfaction. By determining the therapeutic benefit to the patient of new or emerging products, determining the cost of acquisition and handling and evaluating the logistics of the process, materiel management can affect the quality of patient care and, thereby, patient outcomes.

Strategies six and seven—integrate nonsalary resource management and develop new and emerging product valuation—are supported by building blocks that arise from the previous five strategies. Automating transactions with the prime distribution vendor, for example, will eliminate hand-offs and paper-intensive order-

ing, requisitioning, receiving, and payment activities. Implementing redesigned cross-functional processes will eliminate silo operations and improve operational flexibility and customer service. Partnering with the prime distribution vendor to manage warehousing and distribution functions will eliminate hand-offs and allow Inova to focus resources on its core competency of patient care. All of these contribute to our ultimate goal of improved patient outcomes.

WHAT HAS THE PROCESS ACHIEVED TO DATE?

Measurement of our progress has been an important consideration from the beginning, in part as a way to help us communicate clearly with our customers about our activities, but most importantly as a means to quantify what we have achieved through reengineering. To that end, we cross-referenced our goals to performance measures we hoped to affect by the changes (Figure 2).

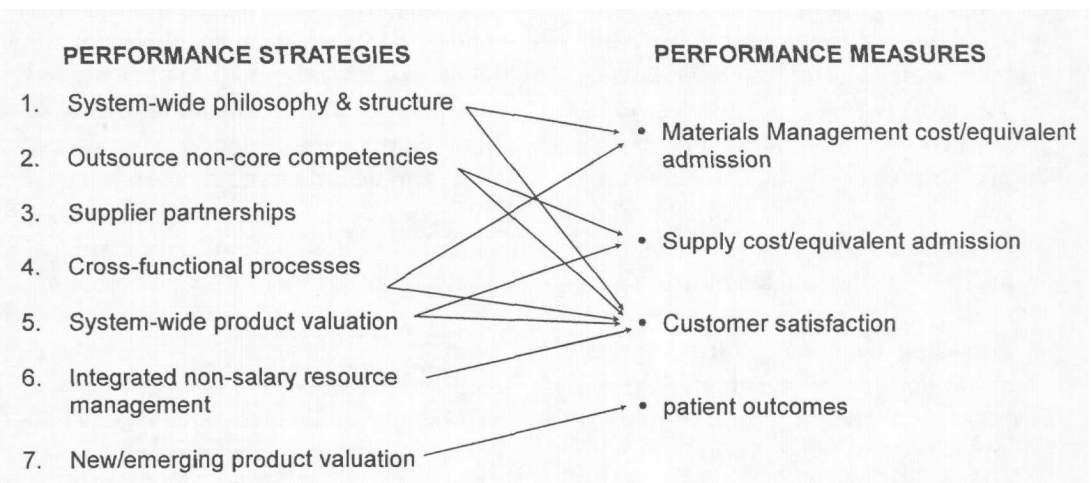


Figure 2. Cross-reference of goals to performance measurements.

It is far too early, however, to give a full assessment of the success of our efforts. We are just about one-and-a-half years into what we expect will be a three- to five-year implementation process. But the indicators to date have fully supported our initial optimism that redesign would bring about significant cost savings. As of March 1996, one year after the initial assessment by Coopers & Lybrand, the materiel management redesign initiative had achieved approximately \$2 million in savings. The majority of these savings are recurring savings.

The numbers are encouraging but they are only a start. Within the next three to five years, we expect the redesign initiative to achieve cumulative savings exceeding \$20 million.

The figures do not by any means tell the whole story. More important are the changes we are already beginning to see in quality, service, and timeliness—ultimately the most important measures of our success as resource managers with a mission of contributing measurably to the clinical and economic outcomes of patient care and to patient, employee, and physician satisfaction.

LESSONS LEARNED

The one-and-a-half years that Inova has been involved in materiel management redesign efforts have proved a valuable learning ground for those of us who were part of the team. Although every organization is different, and thus there is no cookie-cutter redesign process that will work in every situation, we learned a number of lessons that are applicable to any materiel management redesign effort.

- **Start with a macro assessment.**

The eight-week, up-front, quick as-

essment of materiel management practices throughout Inova was, in retrospect, an essential ingredient in the project's success. By mapping our starting points and using benchmarking across industries to set our goals, the team had data to support every move and has been able to track and measure progress over the one-and-a-half-year timeframe. The use of objective standards gave team members confidence in their efforts and made communication about the project more detailed and objective.

- **Seek early buy-in from senior executives.** Inova's materiel management redesign was greatly aided by the support of two Inova senior vice presidents, who mobilized the organization's resources to support the initiative. Richard Magenheimer, Senior Vice President/Chief Financial Officer for Inova and executive sponsor for the team, removed barriers and roadblocks when necessary. At the end of each operations council meeting, the Senior Vice President for Hospital Operations, Jolene Tornabeni, could always be counted on to ask, "What can we do for you?" It became standard practice for the team to devote time before each meeting to decide how we wanted to answer that question.
- **Find a leader and dedicate that person to the project.** During the first six months of the process, one member of the team who had been at one of the smaller operating units emerged as a natural leader. Her subsequent full-time appointment as leader of the initiative gave the team a stable center, someone who had the

opportunity to think through every one of our actions and anticipate the consequences.

- **Communicate, communicate, communicate.** To build awareness and support within Inova for the changes that came with the redesign, the team reported on its efforts every six to eight weeks from the beginning of the process. Team members made presentations at operations council meetings and issued detailed progress reports for publication in internal management updates and physician leadership briefings. We decided on these methods and on the frequency of reports based on an up-front communication survey. In hindsight, we believe that biweekly communication with staff at operating units is the minimum required to ensure that all those affected by the changes are well informed and thus prepared to be supportive of the changes.
- **Have a plan in place to keep morale high among key materiel management employees.** When the redesign process began, employees quickly realized that departmental full-time employees were certain to drop. Inova had a longstanding no-layoffs policy, by which every displaced employee could count on being offered another position somewhere within the organization. Nonetheless, anxiety about the future soon sent several key employees looking for positions in other organizations. In hindsight, we should have come up with a proactive plan early in the process to identify key transitional personnel and offer them “stay bonuses” to encourage them to stay to help Inova

through the transition, whatever their subsequent plans.

- **Manage attrition from the start.** From the first week of the project, we began managing attrition as a means to reduce costs and to help reduce the need for mass reassignments. Instead of filling positions as they became vacant, we reconfigured workloads among existing staff. This strategy allowed us to reduce labor costs further and faster, with less disruption. However, we also found out the down side of such early attrition management: It is often difficult to strike the right balance, keeping enough full time employees to maintain service quality until the operational changes are in place to allow for a reduced number of employees. We considered ourselves very fortunate that the staff—especially nursing staff—at the Inova operating units have been supportive, optimistic, and patient. Instead of viewing us as adversaries, they began to see us as co-workers with common goals.
- **Get help from outside the organization.** By using the expertise and proprietary processes of Coopers & Lybrand, Inova was able to move faster and more decisively on the redesign initiative. Although a fundamental tenet of reengineering is that no one understands the work better than those who are doing it, the consultants guided us through the process, helping us enlarge our thinking and the boundaries of the project. Furthermore, outside consultants were not bound up in the existing hierarchies within the organization, allowing them to assess situations objectively and steer

Inova toward radically new ways of viewing materiel management.

- **Ask not what your outsourcing vendors can do for you, ask if they can do what you need them to do.**

Most organizations that decide to outsource noncore competencies let their vendors define the process. We turned that expectation upside down when we designed our own ideal processes through reengineering. Then, we asked our potential outsourcing vendors to tell us whether they could provide us with exactly the services we needed within the context of our three- to five-year plan and projections. Comparing bids and making decisions became much easier, and we expect our clear specifications will result in a more satisfying partnership in the long run because key expectations will be known to all parties up front.

- **Don't assume the worst about any constituency.** Team members started with the assumption that physicians would be opposed to the redesign process because they might view our efforts as strictly cost-cutting measures and not in the best interests of their patients. Like many such negative assumptions, however, this one was based on fear, not on fact. With the help of our consultants and the team leader, we made a significant effort to educate physicians about the process and to seek their input. As a result, we found that they embraced the concept, and

they have been helpful with the emergence of the new process.

- **Don't let existing processes limit your redesign.** When we began, we were told there was an information system that had to stay, period. We considered that edict nonnegotiable—until we were able to show that it would keep us from achieving half of what we were capable of doing. It makes sense to start redesign with the assumption of a clean slate.

From a traditional position as the organization's unpackers of boxes and stockers of shelves, materiel management at Inova is successfully reinventing itself as an organizational resource manager and a key partner in carrying out Inova's core mission: patient care. Although our work is far from complete, the materiel management redesign effort has emerged as the organizational vanguard for systemwide redesign. Our successes to date are part of the evidence presented to internal constituencies to show that redesign can create an organization that is not just cheaper to operate but also more service oriented, customer focused, and quality driven. Had we simply chosen to superimpose preexisting solutions on our processes to achieve attractive bottom-line savings as quickly as possible, we would have been five-minute heroes. Instead, we are leaders for the long haul, recognized for our considerable (and sometimes hard-won) expertise at retooling processes to meet the challenges of the changing health care environment.