
Executive Summary

Firms across many industries are focusing on product innovation as a critical source of competitive advantage. While redesigning their new product development (NPD) processes is a top priority for most companies, the need for faster cycle times and time-to-market pressures has re-emphasized the critical role of IT organizations in such reengineering efforts. Based on the multi-year experiences of the Sloan Valve Company, we illustrate how an IT-led initiative successfully reengineered the company’s NPD process. We describe key governance and process changes that Sloan Valve made and highlight the role of IT capabilities in enabling the process redesign. From our analysis of Sloan Valve’s experiences, we provide some valuable lessons that can be applied by other companies as they reengineer their critical business processes.

THE NEED TO REENGINEER NEW PRODUCT DEVELOPMENT PROCESSES

After years of retrenchment and cost-cutting, senior executives across many industries are increasingly focusing on the product innovation process—the ability to define and create new products and services and quickly bring them to market—as a critical source of competitive advantage. Faced with intense competition and rapidly changing customer preferences, companies are forced to innovate and introduce new products and services at an increasing pace. In fact, Gartner Group predicts that creation of new products and services will be ranked as the top senior management priority by 2012.

Over the past two decades, organizations have developed their own new product development (NPD) processes and the associated IT support systems, based on traditional approaches to timelines, design reviews, and multiple levels of decision-making hierarchies. The commonly followed approach to NPD is to use six-sigma DMAIC (Define, Measure, Analyze, Improve, and Control) procedures, along with best practices in an ERP system. These home-grown processes have largely focused on tweaking existing NPD activities using six-sigma techniques and other continuous improvement methodologies.

While these traditional approaches to NPD worked in the past, they are unable to meet today’s need for a tightly integrated NPD process. NPD typically spans multiple departments, involving processes that have strong cross-functional interdependencies. Continuous improvement methodologies—while suitable for incrementally improving silo-processes—are ineffective for addressing cross-functional, end-to-end NPD

1 Jeanne Ross is the accepting senior editor for this article.
Processes. Moreover, faster cycle times, time-to-market pressures, and the need for rapid innovative solutions demand that a company must not just tweak but reengineer its NPD process. Senior management has realized that radical innovations in NPD can be ably fostered and executed only by using IT solutions. Companies are waking up to the reality that technological advances and superior collaborative capabilities have placed IT at the forefront of NPD processes. They need to exploit and deploy IT in clever ways to raise product development processes to a higher level. As a result, CIOs are increasingly being asked to oversee and facilitate innovation efforts, including new product development.

Although many companies have failed in this endeavor, some have been successful in IT-led reengineering of their NPD processes. In this article, we describe the successful NPD reengineering experiences of one such company—the Sloan Valve Company, a leading manufacturer of plumbing products. Through in-depth interviews with top executives, study of internal reports and white papers, secondary data reports, presentations, and direct observations over a period of three years (2007-2009), we identified several IT-led change initiatives that make Sloan Valve’s effort a compelling case study. Our specific focus is on the reengineering of the NPD process, which was carried out as part of an ongoing enterprise process redesign program. Our research findings from this case study have important implications for companies facing a variety of process reengineering challenges, including changing the role of IT from being a support function to one that drives business innovation initiatives.

**RECOGNIZING THE ROLE OF IT IN OVERCOMING NPD CHALLENGES**

New product development is a complex activity that involves conceptualizing, designing, producing, and introducing a new product to the market. The process begins by collecting ideas for new products from multiple sources followed by a thorough review of the business cases for the products and creating prototypes. Viable prototypes are further reviewed, with some progressing to successful final products.

Companies typically face three major challenges in their NPD. The first is the number of departments involved in the NPD process. Inputs may be required from the manufacturing, engineering, marketing, sales and distribution, and design departments, and from business units such as finance, purchasing, and project management. This raises complex coordination issues among the various departments, which delays the time to market. Such delays can drastically affect the competitiveness of the company.

Second, managing the idea-generation process is a critical bottleneck in the NPD process. Choosing the group responsible for idea generation, capturing and managing diverse ideas, and tracking the status of each idea is problematic for many companies. Communication gaps could result in huge delays or even in potential product ideas being abandoned. Resources can also be wasted on prototyping unwanted products.

The third major challenge is process accountability. Traditionally, each functional department is responsible only for its own set of activities in the NPD process. Given the cross-functional nature of the NPD process, there is no one department or individual who is held accountable for all issues, resulting in confusion about process ownership.

NPD reengineering addresses these challenges by radically overhauling the NPD process to generate greater business value for the firm. It involves revamping non-viable and less-optimal processes and unifying disparate, siloed processes into a single, integrated NPD process. While companies perceive NPD reengineering as an important business strategy, they also widely recognize the prominent role of IT in bringing about the process change. IT capabilities are one of the fundamental drivers that promote a firm’s business agility and product innovation, leading to distinctive competitive advantages. The IT department can also help break the functional mindset and play a complementary role in enabling

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IT-Led Process Reengineering

The Sloan Valve case illustrates this critical role of IT capabilities in NPD reengineering. As companies realize the gains from transforming their NPD strategies and processes through IT capabilities, they can apply the valuable lessons learned from Sloan Valve on how best to use IT resources and capabilities to achieve IT-led process reengineering.

**REENGINEERING SLOAN VALVE’S NPD PROCESS**

Founded in 1906, Sloan Valve is a mid-sized manufacturer of plumbing products with headquarters at Franklin Park, IL. In 2010, the company had over 1,000 employees with revenues under $1 billion. A family business, Sloan is organized into multiple business divisions and design sites in various locations around the world. The IT department employs less than 50 full-time staff, with very little IT operations and activities outsourced.

Sloan Valve’s product line includes faucets, flushometers, shower heads, and sinks. The company is a pioneer in water-efficient technology-based products, with customers in various industries (e.g., petroleum, chemical, utility, residential housing) and large establishments (e.g., airports, hospitals, educational institutions). Most of its products are made-to-stock or configure-to-order. However, there are some special made-to-order products that are sold through distributors around the world.

NPD is a core process at Sloan Valve, because it strives to launch a range of new products every year. The company’s mission statement emphasizes the importance of NPD:

“To effect a quantum improvement in the Company’s ability to develop, manufacture, market, and distribute breakthrough products and services. These offerings will leap-frog the competition and help ensure the Company’s continued prosperity.”

### Problems with the Old NPD Process

Sloan Valve’s reputation depends on establishing a robust and mature NPD process that drives a culture of innovation. But the company faced a series of challenges in its old NPD process (see Table 1), which spanned 16 functional units. The old process included marketing and sales for processing ideas, and manufacturing and production for delivering the products. Other departments, such as design engineering, were also involved in ensuring the product design complied with specified standards. Most of the products involved electronics, so electrical engineers had to be involved in NPD, and the finance department had to keep tabs on the cost.

<table>
<thead>
<tr>
<th>Table 1: Key NPD Challenges Faced by Sloan Valve</th>
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<tr>
<td>1. Over 16 functional units involved</td>
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<tr>
<td>Complex coordination</td>
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<td>Slow time to market (18–24 months)</td>
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<td>2. Immature process for initiating and screening new product ideas</td>
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<tr>
<td>High idea attrition rate (over 50%)</td>
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<td>Poor idea acquisition</td>
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<tr>
<td>Huge prototyping costs, resulting in considerable wastage of resources</td>
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<tr>
<td>3. Lack of process ownership</td>
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<td>No accountability or dedicated responsibility for NPD</td>
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Because 16 functional units were involved, the time-to-market was a slow 18–24 months. The process for initiating and screening new product ideas was ad hoc, leading to about half the ideas eventually being dropped. Sometimes, the dropped ideas had been prototyped, resulting in unnecessary costs and subsequent wastage. In addition, there was no single person or department responsible for the NPD process, underscoring a significant challenge with accountability. These challenges prevented Sloan Valve from delivering quality new products.

### The Beginnings of Transformation

Prior to 1998, the divisions used Sloan Valve’s internal network to transfer information among them. The company believed that investing in an ERP system would solve some of its communication and coordination challenges because it would not only provide a common database but also replace multiple legacy applications. Sloan Valve chose SAP and spent about 11 months implementing the ERP system. However, Sloan did not realize any significant returns
from its ERP investment. Several bottlenecks were encountered in the ERP system, and when one was rectified, the problem shifted to other areas. The lack of satisfactory results had senior management worried:

“The ERP system very vaguely supported the business as it existed. It was not crafted to support any new business process that we wanted, especially in new product development.” (CEO)

The troublesome ERP implementation caused top management to decide that the IT function needed a new direction, and a new CIO was hired in early 2000. Among his responsibilities were to not only resolve the ERP problems but also to set a new agenda for the IT function, by integrating the IT function with responsibility for business processes.

The CIO soon realized that the ERP system was functioning as specified. Instead, the problems were actually with the processes surrounding the ERP system. As is common in many firms, Sloan Valve had tweaked the ERP system to fit the existing processes; as a result, the system did not provide the anticipated benefits. So the CIO turned to fixing the business processes and set about overhauling them through process reengineering.

“At the time, the company had many folks reporting directly [to the CEO] from multiple silos. I immediately started talking about how we had to look at cross-functional business processes as a way to get value from the ERP system.” (CIO)

The CIO was a strong advocate of process reengineering, but another senior executive preferred an incremental approach to changing the processes. He envisioned a continuous improvement approach where incremental improvements are made to a particular process until it became perfect.

“This senior executive wanted to tweak the process and believed that would equal reengineering over time. [However,] ‘improvement’ is different from ‘redesign.’” (CIO)

Top management accepted this senior executive’s plans and decided to improve the outbound logistics process as a trial, using the continuous improvement approach. After seven months, the results were far from what had been expected. The reason was simple: as parts of a process become enmeshed in a network of processes, multi-level dependencies manifest themselves. Improving just one process in isolation would never solve the problem. Top management now realized there was a clear need to completely reengineer the enmeshed processes. It was also essential to integrate disparate activities across multiple departments, through a common IT platform.

Enabling Reengineering by Appointing the CIO as Chief Process Officer

Integrating multiple departments and processes through a common IT platform was easier said than done. The conventional mindset at Sloan Valve was to view IT as a support function for individual departments, which led to strong boundaries between IT and other functions. Realizing the perils of these boundaries, top management gave the CIO the additional role of Chief Process Officer (CPO), making him responsible for overseeing process changes across the entire organization. In 2004, the CEO announced the amalgamation of the IT and process roles under the singular leadership of the CIO/CPO.

“It was a clear signal from top management. The CIO is typically seen as a person in-charge of technology. By combining the CIO and CPO roles, management sent a clear message that the CIO would from now on lead as a business executive and take on the role of a business leader as well.” (Business Process Management [BPM] Manager)

The CIO/CPO initiated a series of measures to champion process changes across the enterprise, with NPD as one of the first large-scale processes to be redesigned. One immediate initiative was to encourage senior managers to attend formal business process reengineering (BPR) training courses. After attending a BPR training camp led by Michael Hammer (a recognized BPR guru), the owners of the organization were convinced of the potential of BPR and had the entire senior management team attend the training. Over a period of time, all the senior and middle managers, IT business analysts, and IT program managers underwent formal training in BPR, which helped develop a process-oriented mindset in the organization.

As in any major organizational change initiative, a few executives at Sloan Valve resisted the reengineering effort. Senior management, along with the CIO/CPO, worked directly with these executives to educate them and gain their commitment. Despite their best efforts, a few remained reluctant and even opposed the plans. Some of these left the company, and others were moved into different functions. The
CIO/CPO and the senior management now embarked on a set of sweeping changes at Sloan Valve.

**Governance Structure for Process Redesign**

Sloan Valve embraced the process redesign initiative by implementing a two-level governance structure. The strategic-level structure oversaw all of the process redesign efforts across the entire organization, while the process-level structure focused on individual processes (see Table 2).

The CIO/CPO brought key members from different functional departments together to create the strategic-level governance structure. Both IT and business executives were part of this governance level, to enable better communication and coordination across the entire organization. The CEO led the strategic-level governance structure. The process council comprised the company’s president and senior vice presidents from different units. They had the ultimate authority for driving the reengineering efforts, allocating resources, assessing key performance metrics, and approving all the organizational changes.

The CIO/CPO took on the role of architect and visionary for the process initiatives. His role was to raise awareness in the organization about process initiatives, present the business cases for modifying processes, and ultimately set forth the agenda for implementing the changes. An IT manager with considerable knowledge of business functions was assigned as BPM manager. Together with the CIO/CPO, the BPM manager coordinated with the process council to implement the envisioned business process changes.

Table 2: Strategic-level and Process-level Governance Structure

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<tr>
<th>Strategic-level Governance Structure</th>
<th>Process Governance Structure</th>
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<tr>
<td>• CEO: Leads and motivates the redesign effort and sets overall expectations</td>
<td>• Process Owner: Executes process redesign; provides oversight for the process changes</td>
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<tr>
<td>• <strong>Process Council</strong>: Governing body responsible for driving the redesign efforts</td>
<td>• Process Redesign Team: Cross-functional team assigned to assess and redesign existing processes</td>
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<tr>
<td>• CIO/CPO: Acts as architect and visionary for redesign; guides steps for reengineering; responsible for scheduling efforts</td>
<td>• Sustaining Improvement Team: Cross-functional team assigned to tweak a process using continuous improvement techniques</td>
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<tr>
<td>• BPM Manager: Leads process redesign team; oversees and coordinates multiple BPR projects; liaises with functional units</td>
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At the process level, there were three structural components for governing the redesign and implementation of changes to specific business processes. First, for each process, a process owner was identified to execute the redesign and to oversee the change effort. Second, a cross-functional process redesign team, led by the BPM manager, was responsible for reviewing and redesigning the various processes. This team had members from multiple departments related to the specific process and also had an IT-business analyst. Third, the sustaining improvement team was responsible for analyzing the redesigned process and examining key metrics to determine opportunities for continuous improvement after the process had been reengineered. Some of the members from the process redesign team were also members of the sustaining improvement team. This team was charged with designing creative solutions to fix and prevent problems in the process, while ensuring the process improvements stayed on track.

The CPO/CIO and the BPM manager developed a home-grown method for process reengineering by combining and adapting techniques from multiple reengineering frameworks, such as DMADV (Define, Measure, Analyze, Design, Verify), to suit Sloan Valve’s context. This method was further refined and ratified by the process council. The company also employed continuous improvement techniques for post-BPR process improvement. Once a process has been redesigned, it can be further improved through continuously tweaking it.

**Redesigning the NPD Process**

Given the strategic importance of NPD at Sloan Valve, it was only natural that senior management and the process council identified the NPD process as one of the initial areas for implementing BPR. The Director

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of Design Engineering was made the process owner. The NPD process redesign team, led by the BPM manager, had members from the manufacturing, design engineering, IT, finance, marketing, operations, and quality assurance departments. One of the company owners also participated in this team, signaling the importance of the NPD process reengineering initiative. The team also included a business analyst from the IT department.

The NPD process redesign team spent about nine months assessing the current process, mapping sub-processes and associated activities, identifying bottlenecks and documenting interdependencies, and proposing a new end-to-end NPD process. To map the current process, the team used a process visualization tool to depict and assess the process. This tool visually depicted the processes and the process flows among the 16 business functions involved in the old NPD process. The process map also acted as a communication tool to educate management and other organizational members about the complexities and deficiencies of the old process.

During the initial stages of redesigning the NPD process, some managers were still skeptical about the “end-to-end process thinking” approach. Although buoyed by the prospect of radical process changes, they still found it hard to understand how exactly the changes would work and what the new process would look like. Years of silo-based thinking posed a huge barrier, and a drastic shift from the silo-mindset to end-to-end process thinking was needed.

The NPD process redesign team relied on the process visualization tool to achieve this shift. The iGrafx software that was utilized allows users to model processes in real time and drill down to the sub-process level on the fly and also centrally manages diagram files. By using a technique called “process decomposition,” the team decomposed the NPD process into sub-processes to visually represent the as-is state and the to-be state of the process. They then made a presentation to top management.

“This technique typically shocks senior management in terms of how the company actually runs.”13 (CIO/CPO)

“When the to-be diagram goes up, I take the printed as-is diagram [which shows 16 functional units] off the wall and tear it up in front of everybody. At that point, the change process is universally understood.” (BPM Manager)

By cleverly exploiting a simple process visualization tool, the process redesign team not only mapped the current state of the NPD process but also used it as the basis of its “sales pitch” to management to shift to the end-to-end process.

“When we put those big diagrams up on the wall, it’s really the first glimpse most people have of a process in action. The diagrams become a central rallying point that focuses us on customer results rather than functional departments.” (BPM Manager)

To measure the results from reengineering the NPD process, several key performance indicators (KPIs) were identified.14 Important metrics such as time-to-market and innovation rate were decided by the process council, while others were developed by the NPD process redesign team. Some of the critical KPIs were:

- **Time-to-market**: The time taken from idea creation to launch of new products
- **Innovation rate**: Revenue generated from new products (less than three years old) compared to total revenue
- **Total new products**: Number of new products developed per year
- **Portfolio metrics**: Set of metrics that capture the usage of cross-functional teams and resources across all new product development projects.

The NPD process redesign team also used a combination of strategy maps and balanced scorecards to align strategy with process metrics. These maps and scorecards translated a strategic plan into quantifiable targets for the NPD process. By establishing a clear line-of-sight from the evolution of strategy to the corresponding metrics, each strategic plan could be cross-tabulated from the top down and bottom up. The strategy maps and balanced scorecards also provided a clear picture of the existing blocks in the process. In fact, during strategy meetings, the different stakeholders could see how each strategic initiative and process metric corresponded with and impacted one another.

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Upgrading the ERP System

As a part of its NPD reengineering efforts, Sloan Valve sought to better exploit the capabilities of its ERP system, which until then had yielded poor returns. The CIO/CPO decided to upgrade the system to MySAP business suite, with customer relationship management, supply chain management, and product lifecycle management (PLM) components. To support the NPD redesign initiative, the basic components of the PLM module were put in place in early 2006, with additional components added in 2007.

However, upgrading the ERP system was not without challenges. A fundamental challenge was to implement the changes concurrently with the process redesign efforts. Since the NPD process was continually being redesigned, the IT team was faced with an uphill task of continually customizing the PLM module. Moreover, as with any ERP implementation, Sloan Valve faced significant change management problems. The IT team needed to educate lower-level employees about the potential of the new PLM module and gain their support. Employees had to be trained to use different components of the PLM module, such as concurrent manufacturing, design for manufacturability, and quality function deployment.

“The major issues we faced with NPD (and other process efforts) were leadership, change management, and slow organizational changes needed to make process work ‘sing.’ The technology issues are challenging but not nearly as difficult as the human side of change.” (CIO/CPO)

The Reengineered NPD Process

The NPD process redesign team proposed a set of six key sub-processes as shown in Figure 1. The process was overhauled into an end-to-end process, with each sub-process representing a logical set of activities:

- **Ideation**: Create and develop new product ideas and perform feasibility assessment
- **Business case development**: Conduct market analysis and analyze resource needs for the product
- **Project portfolio management**: Prioritize and rank projects that maximize business value and maintain optimal mix of company resources
- **Product development**: Develop the prototype and design for the manufacturing process
- **Product and process validation**: Validate pilot manufacturing and testing, perform manufacturing process validation
- **Launch**: Release product and conduct post-launch activities.

Employees from individual departments were reassigned from individual departmental units to one of the sub-processes, and their incentive structures were aligned with their new roles. For instance, employees assigned to the Ideation sub-process dealt

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**Figure 1: Sloan Valve’s Redesigned NPD Process Comprises Six Sub-processes**

<table>
<thead>
<tr>
<th>IDEATION</th>
<th>BUSINESS CASE DEVELOPMENT</th>
<th>PROJECT PORTFOLIO MANAGEMENT</th>
<th>PRODUCT DEVELOPMENT</th>
<th>PRODUCT AND PROCESS VALIDATION</th>
<th>LAUNCH</th>
</tr>
</thead>
</table>
| 1. Ideation Score  
  2. Features/Benefits  
  3. Feasibility Data | 1. Product Expectation  
  2. Scoring Model  
  3. Summary Analysis  
  4. Market Assessment  
  5. Estimated Time and Resources  
  6. Quality Considerations | 1. Project Ranking  
  2. New Product Gap  
  3. Program Plan  
  4. Project Approvals | 1. Failure Mode Analysis  
  2. Prototype Test Plan  
  3. Detailed Drawings  
  4. Projected Costs  
  5. Patent Application | 1. Field Trial Results  
  2. Tooling Validation  
  3. Pilot Build Validation  
  4. Failure Mode Validation  
  5. Vendor Contracts | 1. Product Release  
  2. Metrics (Projected vs. Actual)  
  3. Lessons Learned  
  4. Business Case Validation |

**Domain**: Marketing and Sales  
**Objective**: Filtering ideas to arrive at the best projects

**Domain**: Product Development  
**Objective**: Developing and Launching Products
with the “fuzzy front end”—generating, capturing, and filtering ideas.

For each new product idea, a cross-functional team (also called a Tiger Team) was created with members from manufacturing, design, marketing and sales, engineering, production, and quality assurance units. The team members’ mixed skill sets and functional roles helped gather varied perspectives on a product idea. The company also invested in training the Tiger Teams to coordinate their activities and to adjust to the new role. For team members, working toward a common goal of delivering a new product contrasted sharply with their earlier silo goals of serving individual departments.

A program management office (PMO) was established to coordinate the product initiatives that were in the NPD cycle. The purpose of this office was to review the number of new products in the pipeline and assign appropriate human and technological resources to the projects. In addition, the PMO prioritized projects and took care of additional resource assignments. It also coordinated with other teams in Sloan Valve’s global development centers.

“Our largest design site has mostly mechanical engineers, a few electrical engineers, and some laboratory technicians. We have cross-functional co-located teams. There are some manufacturing and purchasing people up there to support that group. We also have project managers and engineering directors to lead the team and act as stage-gates.” (VP, Product Development)

In implementing the reengineered NPD process, Sloan Valve adopted two distinct process management mechanisms:

1. The stage-gate methodology to provide necessary controls at the end of each NPD sub-process
2. The funnel approach to filter out less promising ideas before they reached the expensive prototyping stage.

1. Stage-gate Methodology. Sloan used the stage-gate approach as a mechanism to assess the outputs from each of the six NPD sub-processes. The gates were the checkpoints between each NPD stage, where the process council met and reviewed the outcomes. Through the stage-gate model, Sloan effectively established the hierarchical structural overlay necessary for NPD process coordination.

“There are six stages in the NPD process, and each stage has a stage contract. Each gate signs off on the particular stage contract, and these documents are maintained in a central repository.” (VP, Product Development)

2. Funnel Approach. The funnel approach complemented the stage-gate methodology. It mimicked the best practice implementation of the NPD process adopted by other successful companies. This approach conceptually split the NPD process into front-end and back-end activities so that all ideas passed through and were filtered in these two parts. The front-end activities belonged to the marketing and sales domains, whereas the back-end activities were in the product development domain.

The front-end filtering ensured that only appropriate ideas for new products were identified and put forward to the cross-functional team for further discussion. The ideas were further reviewed by a panel of top executives to ensure that they were aligned with the company’s vision and strategy. Business cases were then developed to identify projected revenues from the products. Next, during the project portfolio management sub-process, priorities were set for the various projects, and resources were allocated. The three back-end sub-processes then developed and launched the products. Prior to reengineering the NPD process, many ideas fell by the wayside after they had been prototyped. Now, only the best ideas are taken forward to prototyping, with most proceeding to product development, validation of the product, and product launch.

Executive Oversight of the Reengineered NPD Process

The redesigned NPD process was accompanied by changes to executive oversight of the process and IT capabilities at Sloan Valve. Sensing an imminent need for a senior executive to lead product development in 2008, top management decided to create a new role of Vice President, Product Development. The VP hired was also assigned the role of Executive Process Owner (EPO) for the NPD process. The EPO had the ultimate responsibility for the new end-to-end NPD process, with primary accountability to achieve the NPD goals. The functional heads of the 16 units that carried out different NPD activities were brought under the new EPO. The EPO also focused...
on communicating the NPD process outcomes to top management. The business process owner (who was part of the NPD process redesign team) worked under the EPO to oversee the NPD process activities.

Technology Capabilities Underpinning the New Process

Since Sloan Valve’s NPD challenges started with the failure to deliver the expected benefits from the ERP implementation, the CIO/CPO was keen to develop strong IT capabilities at Sloan. His efforts resulted in the exploitation of two important technologies for NPD—the implementation of a new “Ideation Portal” and the effective use of the PLM module in the ERP system.

1. Ideation Portal. Sloan Valve’s Ideation Portal is an intranet platform deployed to manage new product ideas until they are commercially launched. Prior to implementing this portal, ideas were managed in a haphazard manner. New ideas were passed on as documents to senior management, with no way of tracking their progress as they moved through multiple stages. However, after the launch of the portal, any stakeholder—internal employee or external stakeholders (suppliers, customers)—could directly input a new product idea, with its associated details and potential impact on the marketplace.

The Ideation Portal was principally designed to keep track of new product ideas progressing through the NPD sub-processes (market study, feasibility assessment, business case, prototyping, launch, etc.). The portal therefore supported the funnel approach to NPD. It enabled multiple business units to use a single platform to discuss, collaborate, and exchange viewpoints and knowledge on new product ideas. Moreover, the portal also helped Sloan Valve connect with external stakeholders, such as suppliers and customer groups that provided key inputs on new product ideas.

“The market research is all done by the front end. It’s a huge change from what we used to do before! We are now getting a better match of resources and products in the pipeline.” (CIO/CPO)

The Ideation Portal helped Sloan Valve shift its NPD focus from managing individual ideas to managing a portfolio of NPD projects. Post-BPR, it became easier to track the status of each product idea and compute its ROI. The portal tied in closely with the end-to-end process thinking approach, as key stakeholders could contribute to and work on an idea, and obtain all the details about it, in a single snapshot.

2. PLM Module. The PLM module, which faced some challenges during the NPD process redesign effort, now formed the backbone of the new NPD process. The module was effectively used to support each of the six sub-processes (as shown in Figure 1 above). At the strategic level, the PLM module acted as an executive information system, assimilating all details about the functioning of the NPD process. It provided a dashboard capability to the top executives, with tracking capabilities for defining and capturing the KPIs. Further, it also supported the balanced scorecards, with its integration with other ERP modules and Excel.

At the process level, the PLM module enabled the NPD process owner to keep track of the NPD targets and to look at the efficiencies in the NPD process. If one or more of the stages were lagging behind, the PLM module could be used to understand the process deficiencies at that stage. It enabled the PMO to track and allocate resources for each new product idea. It also supported the stage-gate methodology, as all the stage contracts were stored in a centralized system.

“We have a central repository [in the PLM system] called ‘cFolders’ for managing files. The ideas and the other documents related to ideas, such as business cases, reports, and other documents, are available through a single system. People can see this anywhere in the world as long as you’re connected to the Sloan network. This is important for collaboration around the world.” (VP, Product Development)

The PLM module also enabled the cross-functional team to coordinate with each other, improving overall NPD effectiveness.16 Before this module, product descriptions and other documents were managed on individual computers. The implementation of the PLM module created a centralized repository for storing documents, reports, design templates, and other files. The module also integrated with the Ideation Portal, to map the ideas and the corresponding documents. As the system was web enabled, the stored documents were accessible from any location across the globe. Further, computer-aided design (CAD)/computer-aided manufacturing (CAM) systems were also integrated with the PLM module, improving the

coordination of the design and prototyping sub-processes. Together with the Ideation Portal, the PLM Module significantly improved Sloan Valve’s NPD redesign efforts.

**BENEFITS FROM THE REENGINEERED NPD PROCESS**

Table 3 compares the old and reengineered NPD processes. Time-to-market was reduced from 18–24 months to less than 12 months. After the redesign, customer feedback was easily available via the system. The reengineered process also filtered out early the ideas for new products that were unlikely to succeed. This ensured that ideas that proceeded to the prototyping stage had a better chance of moving to market, thus yielding better ROI. The quality, timing, and synthesis of product and process information throughout the NPD cycle also improved. Notably, there was increased accountability for the NPD process. This also resulted in a better match of projects and IT resources, and avoided having an excess of projects in the pipeline.

**LESSONS FROM THE SLOAN VALVE CASE**

Reengineering any critical business process is challenging for firms entrenched in traditional ways of performing business. Gaining acceptance to the idea, obtaining buy-in from top management and other leaders, and finding a champion could be difficult to accomplish for such companies. However, the Sloan Valve experience shows that by developing key IT capabilities and through effective IT leadership, even mid-sized companies can rapidly transform critical processes. Based on our analysis of the Sloan Valve case, we present five important lessons for companies seeking better ways to utilize their IT resources and capabilities for reengineering their critical business processes.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Old NPD Process</th>
<th>Reengineered NPD Process</th>
<th>Key Benefits from IT-led NPD Reengineering</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time-to-Market</strong></td>
<td>18–24 months</td>
<td>Less than 12 months</td>
<td>Significant reduction in time-to-market for a new product</td>
</tr>
<tr>
<td><strong>Governance Structure</strong></td>
<td>16 functional units</td>
<td>Strategic and process-level governance structure</td>
<td>Better governance of the NPD process</td>
</tr>
<tr>
<td><strong>Systems and Methodology</strong></td>
<td>Informal continuous improvement</td>
<td>End-to-end approach; key performance indicators to measure outputs</td>
<td>Holistic perspective of the NPD process; reduction in process bottlenecks and uncertainties</td>
</tr>
<tr>
<td><strong>Process Accountability</strong></td>
<td>No clear accountability</td>
<td>Well established process ownership (executive process owner, stage-gate model)</td>
<td>Better accountability; assignment of clear-cut responsibility</td>
</tr>
<tr>
<td><strong>Front-End Processes</strong></td>
<td>Poorly managed and fuzzy front end</td>
<td>Cross-functional team owns the front-end processes</td>
<td>Better management of ideas; availability of varied perspectives</td>
</tr>
<tr>
<td><strong>Prototyping</strong></td>
<td>Huge investments in prototyping, since ideas were not managed well</td>
<td>More emphasis on the idea-generation stage, resulting in less prototyping</td>
<td>Significant cost, time, and effort savings due to efficient prototyping</td>
</tr>
<tr>
<td><strong>Idea Generation</strong></td>
<td>Internal group generates ideas</td>
<td>Everyone can contribute ideas (including customers)</td>
<td>Better match between customer expectations and features in the end product</td>
</tr>
<tr>
<td><strong>Management Focus</strong></td>
<td>Focus on selective ideas generated by top management</td>
<td>Focus on managing project portfolios filtered through the front end</td>
<td>Better match of projects and available resources; avoidance of excess projects in the pipeline</td>
</tr>
</tbody>
</table>
1. Recognize the Potential of the IT Organization to Play a Transforming Role

In many companies, the IT organization has traditionally played a support role in business innovation processes and initiatives. However, the Sloan Valve experience shows how the IT function can play a transforming role in driving process changes—by helping the firm take an end-to-end process perspective, by providing able leadership, and by cleverly exploiting IT in the redesign effort.

2. Assign Executive Accountability for the End-to-End Process Redesign Effort

Process redesign is a complicated exercise, fraught with uncertainties, risks, and pitfalls. Sloan Valve’s experience shows that without top management commitment and active involvement, process reengineering would have been nearly impossible. Appointing a technology executive—the CIO—as Chief Process Officer (CPO) who understood both technology and processes was key to success. The CIO/CPO built bridges between the functional executives, worked with them, and acted as the catalyst for change. The two-level governance structure (strategic and process) helped to clearly specify the accountability of all the stakeholders involved in the redesign effort. Once the redesign was completed, Sloan Valve brought in a functional executive (VP, Product Development) as the executive process owner.

3. Leverage and Extend Existing Technology Capabilities in the Reengineered Process

A key lesson from Sloan Valve’s experience is that, for end-to-end cross-functional processes to be implemented, it is not sufficient to make changes to governance and processes. Corresponding changes must also be made to the technologies underpinning the processes. Platforms like ERP systems can provide the fundamental capabilities that can be a powerful launch pad for implementing effective enterprise processes. At Sloan Valve, the PLM module, process visualization tool, and Ideation Portal played crucial roles in enabling the governance and redesign activities at various stages of process reengineering. Understanding the linkages between the different aspects of reengineering and cleverly exploiting technology capabilities to enable transformation are crucial for a successful reengineering endeavor.

4. Design and Govern an Enterprise-wide Process Redesign Methodology

Without a well-thought-out enterprise-wide process redesign methodology, companies run the risk of falling into the “continuous improvement spiral,” where minimal tweaks are made to multiple processes. Minor changes to processes might provide some incremental short-term gains, but greater returns will be elusive without a radical overhaul of the processes.

5. Bridge the IT-Business Divide to Achieve a Process-oriented Mindset

Even experienced experts find the concept of IT-led process thinking challenging. To fully understand and appreciate the potential of IT to enhance collaboration and the exchange of ideas requires that employees in the business receive effective training and are engaged in cross-functional teams. Sloan Valve’s efforts to create process thinking across all levels of the organizational hierarchy proved to be crucial in creating a favorable climate for its process reengineering efforts. This ensured that both senior management as well as operational employees made effective contributions to the reengineering effort.

CONCLUDING COMMENTS

The Sloan Valve case described in this article illustrates that IT-led process reengineering can be successful and provides valuable lessons for other companies. In particular, Sloan Valve successfully changed the perception of the IT organization from a support function to one that drives business innovation efforts, which enabled IT capabilities to play a critical role in process reengineering. Other companies can apply these lessons to make the best use of IT resources and capabilities in achieving IT-led process reengineering. Sloan Valve’s experience shows that even mid-sized companies can rapidly transform critical business processes by developing key IT capabilities and through effective IT leadership.

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