Process Innovation: Reengineering Work through Information Technology

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Process Innovation
Reengineering Work through Information Technology

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PREFACE

Among the technology-oriented consultants and business academics with whom I associated in the mid-to late 1980s, there was a general sense of great opportunity in the air. The opportunity was to apply information technology to the redesign of business processes. None of us knew exactly what this meant, but occasionally we would find a pioneering company that seemed to have tried it.

Jim Short (then of MIT, now at London Business School) and I decided to capture the efforts of these companies, and some general principles about what worked and what didn't, in an article. It took us a couple of years to find enough examples of process redesign (as we called it then) to make a good article. By the time it was published by Sloan Management Review in June 1990, interest in the topic had increased considerably.

When the Sloan article was published I was working at Ernst & Young's Center for Information Technology and Strategy, which proved to be a great platform for learning more about this topic. Many firms visited the center for briefings and informal discussions about process innovation (as we began to call it), and I could also learn about the implementation of these ideas by getting involved in various E&Y consulting engagements. We started a multiclient research program on process innovation, in which we could try out ideas and frameworks on a broad variety of companies that were interested or active in the field. The center played an important role in educating E&Y clients about process innovation, and in developing the firm's consulting methodology in this area. Alan Stanford, who did more than anyone else to establish the center (and who hired me to work in it), and Bud Mathaisel, who ran the center and ran interference for its researchers, deserve much credit for making the book and these learning activities possible.

Several members of the center assisted by writing first drafts of chapters: Mary Silva Doctor with a chapter on approach that was later blended into the first section of the book; Alex Nedzel
with the chapter on IT-based implementation of process innovation; Suzanne Pitney with the chapter on organizational change management; and Larry Prusak with the chapter on information as an enabler of process innovation.

Other members of the center who researched or reviewed aspects of the book include Jennifer Burgin, Scott Flaig, Chris Gopal, Jim McGee, Vaughan Merlyn, Phil Pyburn, and Greg Schmergel. Carol Oulton, Janet Santry, Jean Smith, and Susan Sutherland were very helpful with graphics or word processing.

Working at Ernst & Young, which had a strong consulting practice in total quality management, also helped me understand how process innovation differed from process improvement. I now feel that these two concepts are poles on a continuum of approaches to operational performance improvement. Jim Harrington, Pravesh Mehra, and Terry Ozan of E&Y were particularly helpful in this regard.

Several friends and former colleagues at the Harvard Business School read and influenced the book. They include Lynda Applegate, Bob Eccles, Nitin Nohria, and John Sviokla. Jim Cash and Warren McFarlan gave me feedback on the original article that was useful in writing the book.

Carol Franco, my editor at the Harvard Business School Press, made the publishing process seem easy, made the book seem better, and made all my questions seem reasonable. John Simon and Natalie Greenberg made my prose much more compact and readable. Two reviewers on behalf of the press (Judy Campbell at Xerox and an anonymous academic) also made valuable suggestions on issues of both content and structure.

A book is a family's project, not an individual's. My wife Jodi remained cheerful and encouraging through the late nights, early mornings, and weekends devoted to the book rather than the family. Even my sons, Hayes and Chase, only occasionally resented not being able to play with me or with the family's best computer.

I am also extremely grateful to the managers of companies that were undertaking process innovation initiatives, who shared their experiences and insights with me quite freely. Process innovation (or reengineering, redesign, and so forth) was invented not by consultants or academics, but by these bold and intelligent businesspeople. I simply jumped on their bandwagon at a relatively early stage.
Chapter 1
The Nature of Process Innovation

In the face of intense competition and other business pressures on large organizations in the 1990s, quality initiatives and continuous, incremental process improvement, though still essential, will no longer be sufficient. Objectives of 5% or 10% improvement in all business processes each year must give way to efforts to achieve 50%, 100%, or even higher improvement levels in a few key processes. Today firms must seek not fractional, but multiplicative levels of improvement—10X rather than 10%. Such radical levels of change require powerful new tools that will facilitate the fundamental redesign of work.

The needed revolutionary approach to business performance improvement must encompass both how a business is viewed and structured, and how it is improved. Business must be viewed not in terms of functions, divisions, or products, but of key processes. Achievement of order-of-magnitude levels of improvement in these processes means redesigning them from beginning to end, employing whatever innovative technologies and organizational resources are available.

The approach we are calling for, process innovation, combines the adoption of a process view of the business with the application of innovation to key processes. What is new and distinctive about this combination is its enormous potential for helping any organization achieve major reductions in process cost or time, or major improvements in quality, flexibility, service levels, or other business objectives.

Executives in the organizations we studied and consulted for have expressed great interest in process innovation. They have spent much money and time on less structured and less ambitious approaches to business change with little result. The successes of pioneering firms with process innovation initiatives offer them new hope.
The early results of process innovation are undeniably attention-grabbing. IBM Credit reduced the time to prepare a quote for buying or leasing a computer from seven days to one, while increasing the number of quotes prepared tenfold. Moreover, more than half its quotes are now issued by computer. Federal Mogul, a billion-dollar auto parts manufacturer, reduced the time to develop a new part prototype from twenty weeks to twenty days, thereby tripling the likelihood of customer acceptance. Mutual Benefit Life, a large insurance company seeking to offset a declining real estate portfolio, halved the costs associated with its policy underwriting and issuance process. Even the U.S. Internal Revenue Service achieved successful process innovation, collecting 33% more dollars from delinquent taxpayers with half its former staff and a third fewer branch offices.

Radical process change initiatives have been called various names—e.g., business process redesign and business reengineering. For several reasons, we prefer the term business process innovation. Reengineering is only part of what is necessary in the radical change of processes; it refers specifically to the design of the new process. The term process innovation encompasses the envisioning of new work strategies, the actual process design activity, and the implementation of the change in all its complex technological, human, and organizational dimensions.

**Business Drivers of Process Innovation**

That Japanese firms discovered (or at least implemented) process management long before the West (see Appendix B) helps explain their worldwide economic success. Process improvement and management have characterized some Japanese corporate cultures for decades, and enabled firms in a number of industries to develop fast, efficient processes in such key areas as product development, logistics, and sales and marketing. Often, these highly refined processes are introduced with little attendant use of advanced technology or radical approaches to human resource management. They simply are logical, balanced, and streamlined. The Japanese firms that have developed such processes constitute a major competitive driver for the adoption of process innovation by their Western counterparts.

Today, with competition extended to the execution of strategy, firms frequently woo customers on the basis of process innovation.
The objective of the innovation might be process time reduction—in home mortgage financing, for example, timely approval of loans, to the extent that it reduces the period of uncertainty for home buyers and sellers, constitutes a competitive advantage. Citicorp has reduced process time for some mortgage approvals to fifteen minutes (although recent losses in its retail bank suggest that it might also optimize its processes for consistency and risk avoidance).

Process innovation can also support low-cost producer strategies. Companies that eliminate, for example, costly aspects of their product delivery processes can pass the savings on to customers. The life insurance firm, USAA, has a process objective of avoiding the costs of an agency relationship by relying on telephone-based marketing. USAA's telephone customers are consequently paying lower premiums than those offered by other insurers for the same coverage. The Charles Schwab discount brokerage house also uses this approach.

Competitive pressure is not the only driver of process innovation; increasingly, customers are the impetus for radical process change. The automobile and retail industries offer two notable examples of customer-driven change. Auto manufacturers, responding to intense foreign competition in the 1980s, forced suppliers to increase the quality, speed, and timeliness of their manufacturing and delivery processes. In the retail industry, Wal-Mart has established practices of continuous replenishment, supplier shelf management, and simplified communications that have significantly influenced its suppliers, including such giants as General Electric and Procter & Gamble.

Finance is another powerful driver of process innovation. Companies that have assumed heavy debt loads as a result of leveraged buyouts or fending off corporate raiders often need to cut expenses substantially to improve profitability. Process innovation can be more effective at removing unnecessary costs than many other alternatives such as business unit sales and early retirement programs (which result in a company's most employable people leaving to find other jobs). It may be that in the 1990s overburdened companies will come to terms with their debt through operational, process-based restructurings, rather than financial maneuvering.

There are other occasions that provide "fresh start" opportunities for process innovation. For example, it may be desirable
to redesign a process that is to be outsourced before turning it over to an outside firm. A merger can provide an opportunity for replacing redundant processes with a newly designed process that better accommodates the new firm's objectives. Even a poor IT infrastructure can be an opportunity for process innovation; many firms today need to rebuild major systems, but they should not construct them to support inadequate or inferior processes.

Process innovation can also respond to the need for better coordination and management of functional interdependencies. Better coordination of manufacturing with marketing and sales, it is reasoned, will allow a company to make only what its customers will buy. In the consumer foods business, this process objective often takes the form of reducing the likelihood that goods will become stale; passing information from sales to manufacturing has enabled Frito-Lay and Pepperidge Farm to realize substantial reductions in stales. The automobile industry has labeled this type of coordination "lean production," an approach cited by a major MIT study as key to Japanese success. Achieving a high degree of interdependence virtually demands both the adoption of a process view of the organization to facilitate the implementation of cross-functional solutions, and the willingness to search for process innovations. Existing approaches to meeting customer needs are so functionally based that incremental change will never yield the requisite interdependence.

Of the many operational reasons that private-sector organizations embark on process innovation initiatives, almost all can be traced to the need for improving financial performance. Process cost reduction translates directly into that objective. Other process objectives, such as time reduction and improved quality and customer service, are assumed to translate into higher sales or less expensive production. Even process objectives that involve worker learning and empowerment are ultimately oriented toward improving financial performance, the assumption being that fulfilled workers will be more productive workers. Because process innovation initiatives consume resources that might be spent in some other way, it is reasonable to expect that they will yield financial benefits. However, as will be shown later, improved financial performance is often problematic as the only stated vision or objective for process innovation. Nonfinancial objectives are normally more likely to inspire vigorous efforts to improve work.
A final rationale for process innovation is that it suits our business culture. Even if Western firms could solve their financial problems and satisfy their customers through incremental improvement, why should they suppress their appetite for innovation? Perhaps what American companies need is a process approach that marries radical innovation and the discipline of continuous improvement. A Western version of quality might focus on results as well as process. U.S. firms need a process management approach that embraces both human enablers of process change and the tool that has changed business most over the past three decades—information technology. Western firms can only hope that the combination of process thinking and effective use of technological and human innovation enablers will allow them to catch up with—and even surpass—their global competitors, some of whom have been optimizing and streamlining their processes for many years. As Xerox CEO Paul Allaire, whose firm has successfully created and marketed products of world-class quality, observed: "We're never going to out-discipline the Japanese on quality. To win, we need to find ways to capture the creative and innovative spirit of the American worker. That's the real organizational challenge." 9

**What is a Process?**

Adopting a process view of the business—a key aspect of process innovation—represents a revolutionary change in perspective: it amounts to turning the organization on its head, or at least on its side. A process orientation to business involves elements of structure, focus, measurement, ownership, and customers. In definitional terms, a process is simply a structured, measured set of activities designed to produce a specified output for a particular customer or market. It implies a strong emphasis on how work is done within an organization, in contrast to a product focus's emphasis on what.

A process is thus a specific ordering of work activities across time and place, with a beginning, an end, and clearly identified inputs and outputs: a structure for action. This structural element of processes is key to achieving the benefits of process innovation. Unless designers or participants can agree on the way work is and should be structured, it will be very difficult to systematically improve, or effect innovation in, that work.
Process structure can be distinguished from more hierarchical and vertical versions of structure. Whereas an organization's hierarchical structure is typically a slice-in-time view of responsibilities and reporting relationships, its process structure is a dynamic view of how the organization delivers value. Furthermore, while we cannot measure or improve hierarchical structure in any absolute sense, processes have cost, time, output quality, and customer satisfaction. When we reduce cost or increase customer satisfaction, we have bettered the process itself.

Some managers view the dynamic nature of processes in a negative, bureaucratic sense: "We can't do anything around here unless we follow a process." To the contrary, this book is based on the assumption that following a structured process is generally a good thing, and that there is nothing inherently slow or inefficient about acting along process lines.

A process approach to business also implies a relatively heavy emphasis on improving how work is done, in contrast to a focus on which specific products or services are delivered to customers. Successful organizations must, of course, both offer quality products or services and employ effective, efficient processes for producing and selling them. But U.S. companies spend twice as much researching and developing new products as new processes (these proportions are reversed in Japan), and almost all of the amount spent on processes is targeted at engineering and manufacturing. Marketing, selling, and administrative processes receive very little investment. Adopting a process perspective means creating a balance between product and process investments, with attention to work activities on and off the shop floor.

Researchers of innovation in organizations frequently distinguish between product and process innovation, the former receiving both more attention by firms and more study by researchers. But at least one recent study has pointed out that the two types of innovation often seem to occur together. Indeed, in service industries it is nearly impossible to distinguish between innovative new services offered to customers and the innovative processes that enable them. As these industries mature and seek innovation in their offerings, it is perhaps inevitable that they will adopt more of a process orientation.

Processes that are clearly structured are amenable to measurement in a variety of dimensions. Such processes can be measured in terms of the time and cost associated with their execution.
Their outputs and inputs can be assessed in terms of usefulness, consistency, variability, freedom from defects, and numerous other factors. These measures become the criteria for assessing the worth of the innovation initiative and for establishing ongoing improvement programs.

Taking a process approach implies adopting the customer's point of view. Processes are the structure by which an organization does what is necessary to produce value for its customers. Consequently, an important measure of a process is customer satisfaction with the output of the process. Because they are the final arbiters of process design and ongoing performance, customers should be represented throughout all phases of a process management program.

Processes also need clearly defined owners to be responsible for design and execution and for ensuring that customer needs are met. The difficulty in defining ownership, of course, is that processes seldom follow existing boundaries of organizational power and authority. Process ownership must be seen as an additional or alternative dimension of the formal organizational structure that, during periods of radical process change, takes precedence over other dimensions of structure. Otherwise, process owners will not have the power or legitimacy needed to implement process designs that violate organizational charts and norms describing "the way we do things around here."

Our definition of process can be applied to both large and small processes—to the entire set of activities that serves customers, or only to answering a letter of complaint. The larger the process, however, the greater the potential for radical benefit. A key aspect of process innovation is the focus on broad, inclusive processes. Most companies, even very large and complex ones, can be broken down into fewer than 20 major processes. IBM, for example, has identified 18 processes, Ameritech 15, Xerox 14, and Dow Chemical 9. Key generic business processes include product development, customer order fulfillment, and financial asset management. Figure 1-1 depicts a typical set of broad processes for a manufacturing firm.

Because a process perspective implies a horizontal view of the business that cuts across the organization, with product inputs at the beginning and outputs and customers at the end, adopting a process-oriented structure generally means deemphasizing the functional structure of the business. Today almost every large
Typical Processes in Manufacturing Firms

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Figure 1-1
Typical Processes in Manufacturing Firms

A business organization is characterized by the sequential movement of products and services across business functions—engineering, marketing, manufacturing, sales, customer service, and so forth. Not only is this approach expensive and time-consuming, it often does not serve customers well. In functionally oriented organizations, handoffs between functions are frequently uncoordinated. As a result, no one may be responsible for measuring or managing the time and cost required to move products from laboratory to market or from customer order to receipt. Process innovation demands that interfaces between functional or product units be either improved or eliminated and that, where possible, sequential flows across functions be made parallel through rapid and broad movement of information.

Major processes such as product development include activities that draw on multiple functional skills. New product designs are generated by research and development, tested for market acceptance by marketing, and evaluated for manufacturability by engineering or manufacturing (see Figure 1-2). Processes that involve order management and service cross the external boundaries of
organizations, extending into suppliers and customers. Consequently, viewing the organization in terms of processes and adopting process innovations inevitably entails cross-functional and cross-organizational change.

Adopting a process view implies a commitment to process
betterment. Much recent attention has been given to time reduction as an objective of business change; cost reduction and quality improvement are also familiar. But no single objective is sufficiently ambitious for a process innovation initiative. Many firms have found that they can achieve multiple objectives with each process innovation initiative. Indeed, they must: customers demand cycle time reduction and output quality improvements, while the competitive and financial environments simultaneously demand that process costs be substantially reduced.

Some of these improvement objectives can be found within a functional (i.e., nonprocess) context. Manufacturing, for example, has been improving cycle time and quality for many years. But these improvements often are not perceived by the customer because of poor coordination with other functions. A product is manufactured more quickly, for example, but sits in the warehouse awaiting a customer credit check or resolution of a discrepancy in an order. Consequently, the impact of functional betterment, even when fully achieved, may be limited. Process improvement, on the other hand, whether internal or external, should immediately benefit the customer.

To some, a process orientation might imply a process industry, that is, an industry, such as chemicals, that produces a product continuously rather than in discrete units. But process improvement and innovation as we discuss them here apply to all industries. It may be easier to apply process thinking to manufacturing firms (both discrete and process), because structure and measurement have traditionally been applied to manufacturing processes, but the benefits of process thinking are clearly attainable by service industries as well.
What Constitutes Innovation?

Defined simply, innovation is, of course, the introduction of something new. We presume that the purpose of introducing something new into a process is to bring about major, radical change. Process innovation combines a structure for doing work with an orientation to visible and dramatic results. It involves stepping back from a process to inquire into its overall business objective, and then effecting creative and radical change to realize order-of-magnitude improvements in the way that objective is accomplished.

Process innovation can be distinguished from process improvement, which seeks a lower level of change. If process innovation means performing a work activity in a radically new way, process improvement involves performing the same business process with slightly increased efficiency or effectiveness. The actual level of benefit derived from operational betterment initiatives falls, of course, across a continuum, but in practice most firms seek either incremental or radical change. It is possible that process innovation might yield only incremental benefit, in which case we would classify it as an improvement.14 We are also familiar with at least one instance in which a process improvement initiative yielded radical benefit, albeit in a narrowly defined process.15

For example, a firm that analyzes its customer order-fulfillment process and then eliminates redundant or non-value-adding steps is practicing process improvement. This activity might eliminate several unnecessary jobs, improve customer satisfaction, and reduce delivery time from three weeks to two. Another firm that looked at its order fulfillment process with an eye toward process innovation might provide customers with order entry terminals, eliminate its direct sales force, guarantee order fulfillment, arrange for a third party to manage its warehouse, and empower frontline personnel to handle all financial and shipping details. The latter firm might halve its costs and order fulfillment times. Even the best American performers in terms of quality (i.e., the highest scores in the Baldrige award competition) improve reliability, cycle time, inventory turns, and so forth an average of only 5% to 12%;16 firms undertaking process innovation could not afford to be satisfied with these results.

There are other important differences between process
improvement and process innovation, among them, the locus of participation in organizational change, the importance of process stabilization and statistical measurement, the enablers and nature of change, and the degree of organizational risk. These are summarized in Figure 1-3.

Process innovation initiatives start with a relatively clean slate, rather than from the existing process. The fundamental business objectives for the process may be predetermined, but the means of accomplishing them is not. Designers of the new process must ask themselves, "Regardless of how we have accomplished this objective in the past, what is the best possible way to do it now?"

Whereas process improvement initiatives are often continuous in frequency, the goal being ongoing and simultaneous improvement across multiple processes, it is difficult to conceive of continuous process innovation. Process innovation is generally a discrete initiative. As suggested below, it is best combined with improvement programs, both concurrently across different processes and in a cycle of alternation for a single process.

Process improvement can begin soon after changes in a process are identified, and incremental benefits can be achieved within

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<th>Innovation</th>
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<td>Level of Change</td>
<td>Incremental</td>
<td>Radical</td>
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<tr>
<td>Starting Point</td>
<td>Existing process</td>
<td>Clean slate</td>
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<tr>
<td>Frequency of Change</td>
<td>One-time/continuous</td>
<td>One-time</td>
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<tr>
<td>Time Required</td>
<td>Short</td>
<td>Long</td>
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<tr>
<td>Participation</td>
<td>Bottom-up</td>
<td>Top-down</td>
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<tr>
<td>Typical Scope</td>
<td>Narrow, within functions</td>
<td>Broad, cross-functional</td>
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<tr>
<td>Risk</td>
<td>Moderate</td>
<td>High</td>
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<td>Primary Enabler</td>
<td>Statistical control</td>
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<td>Type of Change</td>
<td>Cultural</td>
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Figure 1-3
Process Improvement versus Process Innovation
months. Because of the magnitude of organizational change involved, process innovation often takes a much longer time. We know of no large organization that has fully identified and implemented a major process innovation in less than two years. Ford's widely reported elimination of three-quarters of its accounts payable staff, achieved by paying on receipt of goods and eliminating invoices, took five years from design to full implementation. This implementation cycle was long despite the fact that the process Ford adopted was already operational within Mazda, its Japanese subsidiary, and was a relatively narrow process. In this situation, managing the changes required in accounts payable took longer than it should have, but process innovation champions should be prepared for a change cycle measured in years. Clearly, if the cycle of process innovation takes too long, the average improvement per year may not exceed that of process improvement, and for this reason we urge both haste and concurrent reliance on process improvement approaches aimed at realizing short-term gains in existing processes.

Bottom-up participation is a hallmark of continuous quality improvement programs; employees are urged to examine and recommend changes in the work processes in which they participate. Visitors to quality-oriented companies frequently see banners, posters, and newsletters bearing quality-related slogans and progress measurements. Some quality-driven firms boast that every member of the organization is a member of a quality circle.

Process innovation is typically much more top down, requiring strong direction from senior management. Because large firms' structures do not reflect their cross-functional processes, only those in positions overlooking multiple functions may be able to see opportunities for innovation. A clerk in the shipping department is unlikely to conceive a radical redesign of the entire order-management process. Ideas from workers and lower-level managers, though they should be solicited, are likely to target incremental improvement. But inasmuch as workers and lower/middle managers are as likely to resist as to propose major change, implementers of process innovation must strive to gain commitment and buy-in at all levels of the organization. Encouraging participation in the process design activity can certainly facilitate this.

Process improvement programs, including those initiated under the quality banner, are generally applied to existing organizational structures and thus involve change in narrowly defined
functional or subfunctional processes. Process innovation, on the other hand, involves definition of and innovation in broad, cross-functional processes. Just the identification of such processes, often for the first time, can lead to innovative ways of structuring work.

Both process improvement and process innovation require cultural change. The necessary focus on operational performance, measurement of results, and empowerment of employees are all aspects of the cultural shift. But whereas it is possible to implement a continuous improvement program without making major changes in organizational structure—indeed, avoiding uncontrolled change is prerequisite to continuous improvement—process innovation involves massive change, not only in process flows and the culture surrounding them, but also in organizational power and controls, skill requirements, reporting relationships, and management practices. The wrenching nature of this organizational change is the most difficult aspect of process innovation and accounts at least partially for its typically long cycle times.

The primary enabler of continuous process improvement programs is statistical process control, a technique for explaining and minimizing sources of variation. Neither this, nor the other key quality techniques, is well adapted to the large variations in process outcomes produced by process innovation.

Process innovation also implies the use of specific change tools. One of these, information technology, has been hailed by many as the most powerful tool for changing business to emerge in the twentieth century. The dramatic capabilities of computers and communications are powerful enablers of process innovation; but though they have yielded impressive benefits for many firms, they have not been as fully exploited as they might be.

Human and organizational development approaches such as greater employee empowerment, reliance on autonomous teams, and flattened organizational structures are as key to enabling process change as any technical tool. In fact, information technology is rarely effective without simultaneous human innovations.

If continuous improvement involves relatively little reward, it also involves little risk. With a few exceptions (such as at Florida Power and Light, where an award-winning quality initiative was abruptly discontinued by a new CEO), quality programs do not die in a visible and obvious way; they are much
more likely to fade into oblivion. Because process innovation initiatives have (or should have) well-defined and ambitious change objectives, failure to achieve these objectives, while not beyond coverup, is usually highly apparent. The level of change involved and the cross-functional nature of process innovation greatly heighten the risk of failure. Managers likely to lose people, power, or other resources as a result of process innovation will naturally be tempted to resist the change.

However different in character, continuous process improvement and process innovation present similar challenges. Both require a strong cultural commitment and high degree of organizational discipline, a process approach, a measurement orientation, and a willingness to change. A company that is unsuccessful at one will probably not succeed at the other.

But although continuous quality improvement may be good practice, it is not a prerequisite for success at process innovation. The skills and enablers of change are different. Success at quality initiatives is a qualification for success in process innovation, but so are many other types of corporate change that involve seriousness of purpose and flexibility—success in merging large organizations, success in downsizing, success in major product or service line innovations.

In practice, most firms need to combine process improvement and process innovation in an ongoing quality program (see Figure 1-4). Ideally (though not necessarily), a company will attempt to stabilize a process and begin continuous improvement, then strive for process innovation. Lest it slide back down the slippery slope of process degradation, a firm should then pursue a program.

![Figure 1-4: Process Improvement and Process Innovation](image-url)
of continuous improvement for the post-innovation process. Furthermore, across an entire organization, innovation initiatives will be appropriate for some processes, continuous improvement initiatives for others.

In order not to confuse the employees who participate in, or are affected by, innovation and improvement initiatives, all such activities should be carried out within the context of a single quality program, and it should be clear which type of process change is under way for a given process at a particular time. For example, we found a very confusing situation at an electrical utility in which both improvement and innovation initiatives were being undertaken at the same time by different sponsors. The quality organization had begun continuous improvement programs along functional lines; the information systems function was sponsoring process innovation programs with radical change objectives, structured along major cross-functional process lines. Even the leaders of these two initiatives were unsure how they related to one another.

The differences between process improvement and innovation can make it difficult to combine the two. One way to facilitate their combination is to assign them to different managers. At Ameritech, where this was done, the manager with responsibility for process innovation and the manager assigned to quality and process improvement communicate regularly and the level of cooperation is high, perhaps because they report to the same person.

A firm should be aware that the risks of process innovation are at least proportional to the rewards. Given this equation, organizations that can avoid such wrenching change should probably do so. In environments that are relatively noncompetitive or in which basic business practices are not in question (e.g., some segments of the utility industry or other highly regulated businesses, or well-funded government organizations), continuous improvement may be preferred over process innovation. But competitive and other pressures force most firms to seek radical change.

**Process Innovation and the Voice of the Customer**

A correctly designed business process has the voice and perspective of the customer "built in." A process should be designed to produce outputs that satisfy the requirements of the customer.
A process innovation initiative should begin with a good understanding of who the customers of the process are and what they want out of it. Asking customers about their requirements and getting them to choose between process trade-offs should be explicit tasks. Improvement or innovation objectives should be primarily those of the customer.

In fact, the customer's perspective should be built not only into the final process design, but also into the early visioning and post-implementation activities. When possible, customers should be included on process design teams and, after a process design has been created, should participate in prototypes of the process and help refine the design. Ongoing measures of the process should be from the customer's perspective, with customers assessing process performance to the extent possible.

Processes such as order management and customer service extend across firm boundaries into the customer organization; in these processes, the customer is not a guest in the design activities, but an owner of them. An interorganizational process should be jointly designed and managed by the organizations whose boundaries it crosses. Costs or bottlenecks should not be passed from one firm to the other, but designed out of the process altogether. This change to a more "networked" view of processes is already beginning to have important consequences for day-to-day management and organization.

**Enablers of Process Innovation**

The idea of focusing on enablers of innovation as potential drivers of change is perhaps radical. Conventional wisdom about business initiatives holds that they must first be planned in the abstract, without reference to specific tools or levers of change. In the traditional planning approach, we define "ends" (corporate objectives), the "ways" in which these ends are to be achieved (specific visions or critical success factors), and the "means" by which we expect to bring these ends about (enablers of change). Hayes, observing that abstract planning only rarely anticipates how a firm will address its environment with specific initiatives, argues that often the appropriate order is "means, ways, ends." Provide the tools for change (including financial, technological, and human resources), and the specific directions in which to apply them will become apparent as the environment changes.
Although fresh and appealing, Hayes's view may not be entirely applicable to process innovation. Some sort of context for process innovation—a sense of the "end"—is necessary to provide focus and inspiration. Change enablers for process innovation are clearly "means" in Hayes's terminology. Rather than following in some fixed order, ends and means are better viewed as influencing each other. The use of information technology in processes, for example, can strongly influence, and should be influenced by, strategy. Regardless of the order of ends, ways, and means, it is important to consider the means or enablers of process innovation before a process design is solidified.

By virtue of its power and popularity, no single business resource is better positioned than information technology to bring about radical improvement in business processes. It is the least familiar of key resources, having existed in a form useful to businesses for a mere 40 years. Especially in hardware and communications components, IT capabilities have grown faster than those of other resources or technologies. We are only beginning to understand the power of information technology in business. But even as we begin to grasp existing IT capabilities, innovations make our perspectives obsolete.

Its great potential notwithstanding, IT cannot change processes by itself, nor is it the only powerful resource. There is a well-developed literature suggesting that the primary enablers of change in organizations are technology (including technologies not based on information) and organizational/human factors. Process innovation can seldom be achieved in the absence of a carefully considered combination of both technical and human enablers.

Possibilities for applying organizational and human factors to process innovation extend over a broad range. Throughout this book, we treat them as equal partners with information technology in effecting process change. For every example of IT as an enabler of new process designs, there is almost invariably an accompanying change in the organizational or human resource type. For example, creating a more empowered and diversified work force, eliminating levels of hierarchy, creating self-managing work teams, combining jobs and assigning broader responsibilities, and upgrading skills are some organizational and human resource changes that frequently accompany the use of IT.

Other process innovation resources—new approaches to
assessing financial costs and benefits, and global business management, for example—have been in managers' portfolios much longer than information technology and new organizational forms and thus may have less potential as enablers of radical innovation. Moreover, even these traditional resources work best when used in concert with information technology and human/organizational innovations.

Firms undertaking process innovation initiatives should not, of course, become preoccupied with particular enablers or tools. The objective of such efforts should be improved business performance, not a lesson in taking advantage of a new technology or alternative human resource tactic. But it is just as foolish to invent new process designs without examining firms that have successfully employed IT and human enablers in similar process innovation initiatives. Just as an architect brings to the design of a building knowledge of the technologies needed to operate it (e.g., elevators, air conditioning, plumbing, and so forth) and the types of people who will work in it, so a process designer must be cognizant of the technologies and people involved in making a process work.

Overview and Background of the Book

This book is the result of more than four years of research into process innovation, in both academic and consulting contexts. It reflects hundreds of conversations with executives and professionals in more than 50 companies. (These companies are listed in Appendix A.) In addition, we reviewed a wealth of case materials on other firms that were in the midst of process innovation. As does most useful business research, our work on process innovation describes the state of the art, and then attempts to go beyond it in terms of analysis, development of frameworks, and prescription.

The breadth of the research notwithstanding, process innovation remains more art than science. Many of the process innovation initiatives we studied had only recently begun. The approaches and methods described here are not the only possible routes to success. This book is for the managers of companies now embarking upon such initiatives, who need information about the nature of process innovation and the experiences of early movers. In describing the efforts of pioneers, the book is itself pioneering. The book is organized in three parts. We first present the
components of a general approach to, and context for, process innovation. These components, although they do not form a detailed methodology, must be aspects of a successful process innovation program. The components of the approach are depicted in graphic form in the introduction to Part I and are discussed in detail in the chapters that follow. Chapter 2 examines the selection of processes for innovation, Chapters 3, 4, and 5 the enablers of process innovation, including information technology, information, and organizational and human resource approaches. In Chapter 6 we discuss the creation of a vision for processes and its relation to corporate strategy, and in Chapter 7, the issue of measurement and short-term improvement of existing processes. Chapter 8 concludes Part I with a detailed review of the design and implementation of new processes.

Part II is devoted to implementation issues associated with radical process change. We recommend in Chapter 9 approaches to managing successfully the kind of large-scale organizational change that attends process innovation. In Chapter 10, we view the implementation of information systems within a process innovation context—that is, we examine how, given a new process design, we can employ IT to rapidly and effectively implement systems that support it.

In Part III, we focus on specific approaches that firms are employing to innovate key operational and managerial processes. Chapter 11 examines innovative approaches to product design, development, and manufacturing processes. Chapter 12 focuses on customer-facing processes, including marketing and sales management, order management, and customer service. Chapter 13 discusses innovation in management and administrative processes, which have been neglected even by firms undertaking process innovation elsewhere.

In Chapter 14, after summarizing key points of the book, we urge both caution and haste in adopting process innovation. Given the rapidly growing popularity of this approach to business improvement, a balanced view of risks and rewards is essential. But neither these cautions, nor the myriad complexities introduced throughout the book, should be permitted to diminish the appeal of this exciting approach to enhancing business performance.

Appendix B traces the historical roots of process innovation. This discussion further elucidates the distinctions between process innovation and earlier approaches to operational improvement. The current relationship of process innovation to quality,
sociotechnical, work design, and competitive systems initiatives is also discussed.

Notes


6 This movement toward interdependence with reference to information technology has been described in John Reckart and James Short, "IT in the 1990's: Managing Organizational Interdependence," *Sloan Management Review* (Winter 1989): 7-18.


12 The 14 processes identified by Xerox apply only to its document-processing business. Since they were originally identified, Xerox has added and changed some processes, and the firm is now developing a new process architecture.
13 The most prominent example of this movement is George Stalk, Jr., and Thomas M. Hout, *Competing Against Time* (New York: Free Press, 1990).


19 This aspect of the difference between improvement and innovation programs is discussed in Robert B. Kaplan and Laura Murdock, "Core Process Redesign," *McKinsey Quarterly* (Summer 1991): 27-43.


PART I
A FRAMEWORK FOR PROCESS INNOVATION

Introduction

Hundreds of firms throughout Europe and America are undertaking process innovation initiatives. Close examination of a number of early initiatives has led us to create a high-level framework to guide process innovation. We present the primary components of a process innovation approach over several chapters. The purpose of these chapters is not to provide a detailed methodology, inasmuch as specific activities undertaken by specific firms will be variations upon these components, differing in order, emphasis, and flavor. Rather, we believe that each component is necessary in some form for a successful innovation initiative. We know of no completed radical process change that has not involved all of these components in some form, whether implicit or explicit, and we are aware of several failed efforts that did not employ all these steps.

Process innovation initiatives are inherently distinct from business as usual. In fact, a number of researchers have argued that the existing Western management paradigm views both improvement and innovation as lying outside routine management activities. Our experience suggests that companies can institutionalize incremental improvement through organizational and cultural change programs, with those doing the work identifying and implementing small changes in product and process. But we see no realistic way to conduct process innovation during the normal course of business. Companies typically treat innovation activities as special tasks, assigned to project teams or task forces. We believe that the project or special initiative structure is the only way to accomplish radical innovation. A project orientation appears to be the best way to introduce and gain experience with process thinking and innovation within an organization, and only
Ad hoc, cross-functional teams may be able to innovate processes that traverse organizational boundaries and areas of management responsibility.

The matrix in Figure 1-1 categorizes various process-based operational improvement methods in terms of the relationship between level of change and context or frequency of application. Value analysis approaches such as process, overhead, and activity value analysis are project-oriented, but yield only incremental improvement. Quality-oriented methods such as business process improvement and activity-based costing mechanisms are intended to yield continuous but incremental improvement. These approaches are treated in greater detail in Chapter 7, where we discuss improvement of the existing process in the overall context of process innovation.

Only process innovation is intended to achieve radical business improvement. It is a discrete initiative that must be combined with other initiatives for ongoing change. The notion of continuous innovation advanced in the management literature pertains to product, rather than process innovation; we have not observed continuous process innovation of the type and scale seen in a typical one-time process innovation effort and believe that such levels of innovation would be difficult to maintain and coordinate on a continuous basis. If nothing else, people and organizations need periods of rest and stability between successive innovation initiatives.

Although it may not be possible to achieve radical innovation

<table>
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<tr>
<th>Context/Outcome</th>
<th>Project/One-Time</th>
<th>Continuous Improvement/Ongoing</th>
</tr>
</thead>
</table>
| Incremental Improvement | • Activity value analysis  
• Overhead value analysis  
• Process value analysis | • Total quality management  
• Business process improvement  
• Activity-based costing |
| Radical Innovation | Process innovation (reengineering, business process redesign) | Not meaningful |

Figure 1-1
Approaches to Business Improvement
while practicing continuous improvement, companies need to learn how to do both—concurrently across different processes, and cyclically for a single process. Ultimately, a major challenge in process innovation is making a successful transition to a continuous improvement environment. A company that does not institute continuous improvement after implementing process innovation is likely to revert to old ways of doing business.

Our framework for process innovation consists of five steps: identifying processes for innovation, identifying change enablers, developing a business vision and process objectives, understanding and measuring existing processes, and designing and building a prototype of the new process and organization (Figure I-2). Excepting change enablers, each step is discussed in a chapter; each of the three major enablers of change merits its own chapter.

Although the sequence of the activities in Figure I-2 may vary, aspects of the ordering are important. Selecting processes for innovation, for example, should be done early in order to focus effort and resources.

![Fig. 1-2](image-url)
Our high-level approach also presumes the establishment of an infrastructure for process innovation. As with any project-oriented business initiative, a project team must be selected and trained. Aspects of team selection that influence the change management process are discussed in Chapter 10. The team infrastructure required for innovation, though similar in some respects to that required for organizationwide continuous improvement, 3 differs most significantly in the need for innovation teams to be familiar not only with particular processes, but also with the enablers of change discussed later.

Notes


Chapter 2
Selecting Processes for Innovation

Process innovation must begin with a survey of the process landscape to identify processes that are candidates for innovation. Both the overall listing of processes and the focus on those requiring immediate innovation initiatives are crucial to the success of innovation efforts. The selection process establishes the boundaries of the processes that are to be addressed, enabling a firm to focus on those most in need of radical change.

The principal activities in the selection process are listed in Figure 2-1. The first is to identify the major processes in the organization. An informed selection can be made only when all of the organization's processes are known. A survey also serves to determine process boundaries that help establish the scope of initiatives for individual processes.

Enumerate Major Processes

Considerable controversy revolves around the number of processes appropriate to a given organization. The difficulty derives from the fact that processes are almost infinitely divisible; the

• Enumerate major processes
• Determine process boundaries
• Assess strategic relevance of each process
• Render high-level judgments of the "health" of each process
• Qualify the culture and politics of each process

Figure 2-1
Key Activities in Identifying Processes for Innovation
activities involved in taking and fulfilling a customer order, for example, can be viewed as one process or hundreds. The "appropriate" number of processes has been pegged at from two to more than one hundred. The three major processes identified by Rockart and Short—developing new products, delivering products to customers, and managing customer relationships—are themselves highly interdependent; and Harvard researchers working on order management issues have argued for only two processes (1) managing the product line, and (2) managing the order cycle. A well-known management consulting firm has asserted that there are only three or four "core" processes, though not all business activities are part of these processes. Finally, at least one firm, Xerox Corporation, has identified a larger number of processes, but has focused its change efforts on those it considers most critical or core. IBM, which in the 1980s had defined at least 140 processes across the corporation, is today working with 18 much broader processes.

The objective of process identification is key to making these definitions and determining their implications. If the objective is incremental improvement, it is sufficient to work with many narrowly defined processes, as the risk of failure is relatively low, particularly if those responsible for improving a process are also responsible for managing and executing it. But when the objective is radical process change, a process must be defined as broadly as possible. A key source of process benefit is improving handoffs between functions, which can occur only when processes are broadly defined. Moreover, if a process output is minor, radically changing the way it is produced is likely to result in suboptimization or, at best, only minor gains.

As noted earlier, most of the companies that have identified their processes in the context of process innovation have enumerated between 10 and 20. Key processes identified by IBM, Xerox, and British Telecom are presented in Table 2-1. The appropriate number of processes reflects a trade-off between managing process interdependence and ensuring that process scope is manageable. The fewer and broader the processes, the greater the possibility of innovation through process integration, and the greater the problems of understanding, measuring, and changing the process.

Our experience leads us to set the appropriate number for major processes at between 10 and 20. Within this range—which
<table>
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<tr>
<th>Key Business Processes of Leading Companies</th>
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<tr>
<td><strong>IBM</strong></td>
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<tr>
<td>Market information capture</td>
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<tr>
<td>Market selection</td>
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<tr>
<td>Requirements</td>
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<tr>
<td>Development of hardware</td>
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<td>Development of software</td>
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<td>Development of services</td>
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<td>Production</td>
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<td>Customer fulfillment</td>
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<td>Customer relationship</td>
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<td>Customer feedback</td>
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<td>Marketing</td>
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<td>Solution integration</td>
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<td>Financial analysis</td>
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<td>Plan integration</td>
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<td>Accounting</td>
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<td>Human resources</td>
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<td>IT infrastructure</td>
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leaves us with some cross-process activity, but renders each process small enough to be understood—change management is only very difficult, rather than impossible. Constricting the range also permits us to identify both operational and management processes and to find different approaches to redesigning each type. This does not mean that all of the identified processes will be of the same importance, or even that innovations will be identified for all of them.

Some firms may wish to maintain both broad and narrow processes. While addressing broad processes in an innovation context, they may also be working on narrow processes from an improvement context. In order to avoid confusion, some mapping of
narrow processes to broad processes should be developed. That is, a broad process like order management should be broken down into its constituent processes (or subprocesses, if that is the preferred terminology). The mapping need not be perfect—a narrow process, for example, could cut across two broader processes—but it should provide some orientation for all participants in process management initiatives. Among the firms we have researched, only British Telecom has developed such a hierarchy of broad and narrow processes.

Whatever the number of processes identified, the identification process should be understood to be exploratory and iterative. As a process becomes the focus for innovation or improvement efforts, its boundaries and relative importance become much clearer. Most companies that have worked on their processes for a number of years have revised their original lists.

Certain strategic-planning and systems-planning approaches that have a business process perspective may be useful for identifying processes. For example, Porter's framework for organizing a company's business activities emphasizes the usefulness of identifying and exploiting linkages in the value chain as a means of identifying both competitive opportunities and high-level processes, and Ives and Learmonth have developed a generic customer-resource life cycle that describes the process by which a customer acquires, uses, and disposes of resources as a vehicle for identifying strategic information systems. Neither of these approaches describes explicitly how a company should define these frameworks for its own use.

In the context of business process improvement, Harrington suggests having executives jot down the processes for which they are responsible and analyzing and distilling their lists to arrive at the company's slate of processes. This top-down approach, guided by our rule of thumb of 10 to 20 major processes, can be fairly effective. A major manufacturing concern used a similar approach to define its key processes. A candidate set of processes was developed by the corporate process-innovation staff and external consultants and presented to senior executives, who refined and revised the process list during a facilitated workshop discussion.

**Determine Process Boundaries**

Once the processes have been identified at a high level, the boundaries between those processes need to be managed. Because
process definition is more art than science, boundaries are arbitrary. A number of questions may help to define boundaries, among them:

- When should the process owner's concern with the process begin and end?
- When should process customers' involvement begin and end?
- Where do subprocesses begin and end?
- Is the process fully embedded within another process?
- Are performance benefits likely to result from combining the process with other processes or subprocesses?

Inasmuch as the end of any process is the beginning of another, either within or outside the organization, process innovation will often result in changes to upstream and downstream processes. Consequently, process management is best viewed as an iterative activity, in which subsequent innovation in one process gives rise to a need to reinnovate, or at least modify, others.

Assess Strategic Relevance

Having identified the boundaries of its major processes, a company must select individual processes for innovation. Our experience suggests that the scope of the innovation effort should be based on an organization's capabilities and resources. IBM has innovation initiatives under way in all 18 of its key processes at once, but most companies cannot successfully deal with innovation on such a scale. Even given a clear need to redesign, most organizations would lack sufficient resources—people, funds, and time—to do so. Beyond resources, most organizations could not endure the magnitude of organizational change that innovating all processes simultaneously would precipitate. An organization must understand the level of change and upheaval it can endure and must use that knowledge to determine how many processes it can successfully innovate.

Moreover, simultaneous change in multiple processes can be difficult to coordinate. Because redesigned processes must still interface with upstream and downstream processes, process owners or managers must communicate frequently about directions and interface points. If changes in one process must be coordinated
with changes in, say, 17 others, it will be very difficult to make much headway.

Nevertheless, some firms find that they must work on groups of processes to solve particular business problems. Xerox, for example, found that to affect the time it takes to bring products to market it had to address not only its product design and engineering processes, but also processes such as manufacturing, service, and logistics. Similarly, IBM discovered that to speed delivery of custom-built products to customers, it had to address the production, logistics, and customer fulfillment processes.

Most companies choose to address a small set of business processes in order to gain experience with innovation initiatives, and they focus their resources on the most critical processes. Each successful initiative becomes a model for future efforts. We have identified four criteria that might guide process selection: (1) the process's centrality to the execution of the firm's business strategy, (2) process health, (3) process qualification, and (4) manageable project scope. Ideally, all four factors should favor the selection of a particular process; in practice, results are often ambiguous, and differential weighting of the factors must be applied.

The most obvious approach to process selection is to select the processes most central to accomplishing the organization's strategy (this presumes that the organization has a well-articulated strategy). Many firms' strategies, for example, focus on improving relationships with customers. One aspect of a customer-focused strategy is the provision of superior customer service at every point at which customer and enterprise meet. Such companies are likely to select for innovation processes at the customer interface, such as order management and customer service. In a more formal approach, the associations between business goals and business processes are identified and some sort of prioritization is done, based, for example, on the number and importance of goals the process supports. This approach to process selection is part of a number of planning and improvement methods.

Selection on the basis of health targets redesign processes that are currently problematic and in obvious need of improvement. Among the many symptoms of unhealthy processes is the existence of multiple buffers, reflected in work-in-process queuing up at each step. One study of idle versus processing time for work-in-process revealed that, for the average process, actual working time comprises only .05% to 5% of total elapsed time.
Corporation discovered, for example, that value-added time for the financing-approval process amounted to only 90 minutes out of a three-to-four-day cycle time. We have seen several insurance companies in which the time spent actively processing and underwriting an insurance policy was only two or three hours, in an overall process cycle of more than 20 days. Process health is also suspect if a process crosses many functions and involves many narrowly defined jobs or has no clear owner or customers. Good indicators here are if no one gets upset when the process product is late or over budget, or no one is sure whom to call when deficiencies are noted.

Process health assessment at Cigna is aided by a process innovation group created by the insurance company to assist business units in their process innovation efforts. Upon receiving a request from a business unit, the group conducts a brief study to evaluate opportunities for process improvement. The group then advises the business unit whether to proceed with the innovation. Among the first processes Cigna selected for innovation were in reinsurance, a relatively small business in which it was losing ground. Believing that the division had no choice but to pursue radical change, the head of the business unit told her employees: "If we succeed, half of us will no longer have a job in this division. If we fail, none of us will."

Even after a specific process has been selected, the enterprise must define the process in a way that results in a manageable innovation project scope. Some of the common ways of defining the process are by geography or by product line. One manufacturer seeking to improve the product development process decided to focus on its most profitable product line. After achieving dramatic results for this product, the next step was to begin introducing the other products to the new process.

A final point regarding process selection relates to process "qualification," an activity we observed in nearly every company in which we observed process innovation. The primary goal of process qualification is to gauge the cultural and political climate of a target process. A process "consultant," a key role discussed in a later chapter, is engaged to select only processes that have a committed sponsor and exhibit a pressing business need for improvement. Where commitment is lukewarm or the business need less than dramatic, the consultant would be expected to advise against attempting process innovation.
The determination of high-priority processes is often fairly obvious. At Continental Bank, because the firm had focused heavily on building broad relationships with corporate customers, the relationship management process was a natural place to start. At Bethlehem Steel, the process of scheduling a customer order into the production schedule was chaotic and inefficient and often led to customer dissatisfaction and sales force frustration. Therefore, the customer service process, which included production scheduling, was an easy selection. When Federal Mogul's Chassis Products Division analyzed its business, executives concluded that the failure to deliver new product prototypes quickly was a major impediment to increased sales. Applying radical change to this process was then not a difficult decision.

Regardless of how much care is taken in the identification and selection of processes, the process landscape will almost inevitably change with time and experience. The firms we have studied spent several years traveling the process innovation path, in the course of which most changed the number of processes they defined, the boundaries of individual processes, and the relative priorities of processes as candidates for innovation initiatives.

The Fate of Processes Not Selected

Processes not selected for early innovation initiatives must still be addressed. Recognizing that it can only be approximate, since business directions often change quickly and the resources for process innovation may rise and fall unpredictably, we advise creating a timetable for initiating innovation efforts. We do not recommend extending such a timetable over more than three years, since beyond this period predictions of business priority and resources are likely to be poor. Finally, innovation initiatives should be undertaken soon after detailed process qualification activities, since management commitments and process capabilities are also volatile over a period of several years.

Another alternative, discussed in the previous chapter, is to apply process improvement to processes not selected for innovation. This poses two problems. One, process improvement relies on a completely different set of methods and approaches. And two, it is difficult to apply incremental improvement to processes scoped broadly for purposes of achieving radical change. Because the bottom-up, participative nature of process improvement presumes
a process that workers at lower levels in the organization can get their arms around, it may be necessary to break up the process into less unwieldy subprocesses. Should it later become a candidate for an innovation initiative, the process can be attacked in its broader form.

At least one firm, IBM, is pursuing improvement efforts concurrently with process innovation within the same process. The innovation efforts focus on broad processes, the improvement efforts on narrower constituent subprocesses. But it is not clear to many lower-level IBM process-improvement teams how their efforts relate to the enterprise-level process innovation initiatives. Although the notion of conducting top-down innovation and bottom-up improvement at the same time might seem appealing, much of the process improvement activity is likely to be for naught, inasmuch as teams might strive to improve narrow processes that do not even exist in the new process design. Whenever these activities are to be attempted simultaneously, it should be made clear to all parties that the improvements are likely to be short-lived and should therefore be implemented quickly if they are to yield any benefit.

Summary

Identifying and selecting processes for innovation is an important prerequisite to process change. But this step is also significant in its own right. Without some focus on critical processes, an organization's energies, resources, and time will be dissipated. Especially during the early phases of process innovation, it is important that an organization demonstrate some successes. It can do so only if it is selective in the processes it chooses to innovate.

After a process has been selected for innovation, a firm can begin to think about how it will create quantum improvements in the process and what change tools it will employ. The next three chapters address the issue of how radical change in process designs is enabled. Each considers a different enabler of process change. Chapter 3 begins this discussion with an in-depth analysis of the role played by information technology in process innovation. Chapters 4 and 5 address the enablers of information and human/organizational factors.
Notes


4 British Telecom has identified multiple levels of processes. The 15 listed in Table 2-1 are at the second level; the first-level processes are: (1) Manage the Business, (2) Manage People and Work, (3) Serve the Customer, (4) Run the Network, and (5) Support the Business.


Chapter 6
Creating a Process Vision

Creating a strong and sustained linkage between strategy and the way work is done is an enduring challenge in complex organizations. Because business processes define how work is done, we are dealing with the relationship between strategy and process. Process innovation is meaningful only if it improves a business in ways that are consistent with its strategy. In fact, process innovation is impossible—or at least only accidental—unless the lens of process analysis is focused on a particularly strategic part of the business, with particular strategic objectives in mind. Even the powerful enablers of process innovation discussed above should be applied, not indiscriminately, but in the context of a strategic focus. Earlier, we discussed the selection of strategic processes for innovation. Here, the focus is on embodying an organization's strategy in a vision of the future process state.

Inspiring a vision for operational processes clearly is not the only role for strategy. High-quality, low cycle-time products and services are only useful if they fit the external environment and satisfy a customer demand. This is not always the case with companies that make quality—which is not a strategy, but a way of implementing strategy—a key aspect of their strategies. Examples of this problem abound. A defense industry that has invested heavily in quality at a time when governments are determined to spend less on defense might better have devoted resources to finding commercial markets for its products and expertise. The Cadillac division of General Motors won the Malcolm Baldrige quality award, yet continues to lose market share to Lincoln-Mercury, even among buyers of American luxury cars. This lack of fit between operations and strategy has been called "the six-sigma buggy-whip company" problem.

Congruence or alignment between strategies and processes is essential to radical change in business processes. Strategy and process objectives must reinforce one another and echo similar themes. The concept of strategic "fit" is not new; it underlies the
notion of fit as developed by James Brian Quinn, and Anthony Athos and Richard Pascale's "7S" model, which calls for alignment among strategy, structure, style, systems, skills, staff, and superordinate goals.

What is missing in the discussions of strategy experts is the notion of process or process innovation. Fit between strategy and process, always important, is particularly important when the goal is radical business change. A well-defined strategy, in particular, is essential to provide both a context for process innovation and the motivation to undertake it. Radical change cannot be accomplished without clear direction.

But strategy cannot motivate innovation in the absence of a well-defined process vision. A process vision consisting of specific, measurable objectives and attributes of the future process state provides the necessary linkage between strategy and action. Unless such a vision is shared and understood by all the participants in a process innovation initiative—before redesign begins—the effort will all too easily slip from innovation to improvement.

Use of the terms "process simplification" or "process rationalization" in a process change initiative usually indicates that no vision is present, and that only marginal change is likely to be achieved. These terms pertain to the elimination of obvious bottlenecks and inefficiencies, with no particular business vision as context. Rationalization has a long tradition in industrial engineering, as evidenced in a 30-year-old manufacturing-oriented reference note from the Harvard Business School:

A good manager... is expected... to show that job improvement or simplification of work is not only important but also is based on common-sense questioning aimed at uncovering the easiest, most economical way of performing a job.

Process innovation is much more than rationalization or simplification, and more than common sense. It questions conventional wisdom about what is easy and economical and thus at times leads to more complex, rather than simpler, processes. Phoenix Mutual Insurance's new underwriting process, which speeded underwriting by making activities parallel rather than serial, is a much more complex process than its predecessor, and Federal Mogul's new process for producing automobile component prototypes, though it has more steps than the old process, takes one-seventh the time. Not only are rationalization and simplification invalid objectives for process innovation, they can be distracting.
or even misleading as a way of communicating what the effort is all about.

Process visions, like strategies, should be easy to communicate to the organization, nonthreatening to those who must implement (or who are affected by) them, and as inspirational as measurable targets can be. These criteria generally make cost or headcount reduction objectives less than satisfactory, since they are rarely inspiring and are almost certain to be perceived as threatening by employees. When cost reduction is the ultimate objective, it should be mixed with other intermediate objectives, such as time reduction or quality improvement, that might lead to cost savings. In the several firms we have observed in which cost savings is the stated rationale for process innovation initiatives, there has been a notable reluctance to participate in or otherwise aid the program.

Although the empirical evidence is slight, we believe that firms that have quality, improved work life or learning, or time-oriented objectives often achieve cost reduction in their process innovation initiatives, while those that strive only for cost reduction may not achieve even that. The futility of focusing exclusively on cost was observed in an Ernst & Young survey of factors leading to product competitiveness, though it did not take an explicit process perspective.

Process change without strategy and vision seldom goes beyond streamlining, with a resulting incremental reduction in time and cost. Even process improvement is most valuable in a strategic context; streamlining is most useful in areas that really matter to a business. Change is much more likely to be successfully implemented by and to benefit a business when it is focused on what matters most. General Electric's corporatewide "Work-Out" program for eliminating unnecessary work, for example, is focused on no particular business strategy other than productivity improvement and lacks specific objectives regarding the level of work to be eliminated. A masterpiece of employee communication that encourages overworked employees to try to find ways to reduce their own workloads, the program has been praised in the popular press, and analysis has revealed examples of functional productivity improvements. But several managers we interviewed reported that Work-Out had yielded at best incremental results, and that the program's methods were better described as process improvement than innovation.

Far more impressive results have been achieved by General
Electric in a more focused effort at its Salisbury, Maryland, electrical equipment plant. This plant's business strategy was to reverse several years of poor financial results in the circuit breaker business through innovation in process, organizational structure, and technology. The plant adopted self-managing work teams, established electronic linkages with customers, and developed highly visible measures of process performance. These process innovations have reduced customer complaints tenfold, costs by 30%, and delivery cycles from three weeks to three days.

This contrast of two operational improvement initiatives at GE suggests that business units are the appropriate locus for process innovation efforts. When multi-SBU corporations define strategies at the corporate level, they generally involve financial or market share objectives such as GE's desire to be the largest or second-largest business in every industry in which it participates. It may not be possible for an organization the size of General Electric to define at the corporate level strategies that can inspire process innovation in specific businesses.

Key activities required to create visions for process innovation are listed in Figure 6-1. A firm's business strategy provides the overall context for an innovation effort and is assumed to be an input into the innovation initiative. The primary output is process vision, consisting of specific objectives and attributes.

In this chapter, we discuss how business strategy should inform process visions and what role customer perspectives and external benchmarking should play in formulating them, and we consider in depth what their context ought to be, including performance objectives and specific process attributes.

**Figure 6-1 Key Activities in Developing Process Visions**

- Assess existing business strategy for process directions
- Consult with process customers for performance objectives
- Benchmark for process performance targets and examples of innovation
- Formulate process performance objectives
- Develop specific process attributes
Assessing Existing Business Strategy

Whereas most recent literature on strategy and vision focuses on the content of strategy and the formulation of strategic position relative to environment, customers, competitors, and so forth, here we are concerned with the implementation of strategy as a means to guide and inspire process innovation. Definitions of strategy and vision abound. We view strategy as long-term directional statements on key aspects of a firm or business unit, and vision as a detailed description of how, and how well, a specific process should work in the future. Vision is thus more tactical than strategy, although both must be formulated at a high level. Moreover, a strategy should be visionary (i.e., look into the future), and a vision strategic (i.e., have a broad, key issue focus). This gives rise to possibilities for confusion.

We assume for purposes of this book that a well-defined business strategy is antecedent to a process innovation initiative. We do not assume that there is a single, correct strategy for an industry or product. Companies can succeed with very different strategies as long as they are well executed.

A defined strategy is a primary determinant in both the selection of, and development of process visions for, processes to be innovated. The roles of business strategy and other aspects of a firm's environment in selecting processes for innovation were discussed earlier; here, we examine the relationships between strategy and process visions.

Because it bears a heavy load in establishing a context for process innovation, a strategy, in addition to positing a broad view of a future state, must also meet the following criteria.

- Strategy should be at least partially nonfinancial. Revenue, profitability, or ROI-based visions often lack meaning for those who will not necessarily benefit from their achievement (i.e., most employees). Nor do such visions help employees understand how their targets are to be achieved. It is, in fact, all too easy for executives to state financial strategies without knowing how they will be achieved. Financial goals, though important, must be combined in a balanced way with process-and product-oriented goals.

- The components of a strategy should ultimately be measurable. Nonfinancial strategies are not as easily measured as
financially oriented strategies. Yet a strategy is meaningless unless progress toward its goals can be assessed, a requirement frequently violated in many companies as noted in the literature on nonfinancial performance measures and "strategic control."10

• Strategy should focus an organization on specific aspects of its business to which process innovation can be usefully applied. To strategize about becoming a "world-class" company is not terribly useful; becoming the world's best at logistics and distribution is a much more workable strategy.

• Strategy should be distinctive to an industry and company. We are familiar with many steel industry strategies that don't mention steel, airline company strategies that don't mention flying, and so forth. This aspect of strategy, although not important in itself, renders other requirements more likely to be met.

• A strategy should be inspirational. In order to inspire, a strategy must be clearly understood and meaningful to its audience and be the genesis of a considerable amount of work. An inspirational strategy can provide energy when setbacks occur or implementation teams lose momentum. The emotional content of a strategy is sometimes captured in its mission statement. This issue has often been ignored or paid lip service, but companies that have acknowledged it have had successful results.11

• A strategy should be for the long term—five or even ten years. It should be broad enough to encompass a variety of opportunistic directions within its overall context.12 The notion of a long-term yet flexible strategy is captured in the recent literature on "strategic intent."13 A flexible strategy should be capable of accommodating movement into new businesses built around information and information technology. For example, Baxter Healthcare, American Airlines, and a number of other firms that have created electronic distribution processes now use them to distribute products well outside their mainstream businesses (in Baxter's case, office supplies, in American's, flowers and candy).

• The method employed to create a strategy, like the change
levers that enable process innovation, should be broadly focused and address key tools for change. The planning method that best seems to do so is scenario-based planning. 14

Among the companies pursuing process innovation that have strategies well suited to their process needs is Continental Bank, which has a strategy that calls for being a business bank that provides excellent service to a small number of medium-sized customers. Continental Bank's chairman Thomas Theobald's frequent spoken and written comments about the need for radical change in banks and banking regulation—e.g., "Frankly, I just don't think that cuts of 10 or 15 percent will do the job"—motivate innovation rather than improvement. 15 Continental is struggling to adhere to its strategy and achieve strong financial results, but it clearly has come a long way since its bankruptcy in the early 1980s.

Rank Xerox U.K.'s strategic shift from selling copiers to marketing document management systems might seem a subtle distinction, but the firm's executives have developed explicit measures of success (e.g., 50% of revenues from systems by 1990) and oriented new process designs toward improving these measures. 16 In contrast, IBM has launched an ambitious process innovation program based on a strategy of "market-driven quality," which, though admirable and likely to yield some benefits, may not be sufficiently focused to bring about truly radical change or inspire specific and aggressive process visions. Indeed, in attacking 18 key processes simultaneously, the company is more likely to achieve process improvement than innovation. 17

Satisfying the foregoing criteria for strategy improves a firm's chances of success in the search for process innovation. Yet any of these requirements can be taken too far. Nonfinancial strategies make sense only to the degree that they lead to better financial performance. Overemphasis on measurability and an overly detailed focus can inhibit both a strategy's long-term applicability and its ability to inspire employees. Strategy, moreover, provides only an internal perspective in creating a process vision. There are many ways to implement even a well-defined strategy. Many innovative ideas for process design and the use of enablers can come from sources outside the organization, including customers, competitors, and firms in completely different
businesses. To incorporate these sources into its visioning activity, an organization must include in its process innovation initiative both a structured exercise to understand customer perspectives and a round of external benchmarking.

**Customer Inputs into Process Visions**

A key aspect of creating a process vision is to understand the customer's perspective on the process. As noted previously, the customer of a process can be either internal or external to the firm; in practice, most firms are more concerned about the perspectives of external customers, and therefore place a high priority on customer-facing processes.

Asking customers what they require of processes serves multiple purposes. In the context of creating visions, the customer perspective furnishes both ideas and objectives for process performance. Seeking customer input also demonstrates a desire for a close relationship, although this input must be actually factored into process designs to fully achieve this objective. Finally, new processes may require that customers change their own behavior for the process to be fully effective. Seeking input at an early stage starts building customer commitment to the needed changes and lets customers begin their own process transition.

Of course, most processes have multiple customers. It is often not very useful to treat all customers equally; a written questionnaire sent to hundreds of customers, for example, will seldom deliver meaningful results. It is much more valuable to select a limited set of customers, based either on their importance to the firm or their ability (and willingness) to furnish thoughtful input, and spend more time with each one. Focusing on a few customers also allows for less structured interview processes in which innovative ideas can be sought.

The type of inputs that should be solicited from customers are broad, encompassing desired process outputs, performance, flow, enablers, and other relevant factors. The method of customer contact may take several forms. A focus group may be the best way to deal with individual, rather than organizational, customers. Some firms prefer to send consultants to talk to customers, so that they will not hold back on their true feelings. Other firms would never pass up an opportunity to build closer personal relationships with customer executives. Sometimes the solicitation
of opinions from customers can be done in an informal setting. For example, the discussions that led to Procter & Gamble's continuous replenishment processes for Wal-Mart took place during a fishing trip by Sam Walton and a P&G executive.

In our experience, customers rarely provide breakthrough ideas for process innovations. Instead, their objectives are to improve the existing process incrementally: "I would like to have more on-time deliveries." These types of inputs are important, however, because they specify the areas in which innovation should take place. If the customer feedback process is somewhat iterative, taking place throughout a process innovation initiative, customers can react to successively more concrete process designs. As is true for user participation in the design of information systems, customers often do not know what they want until they see what they can get, or until they see something that they know they don't want.

Process Benchmarking

As practiced in the quality movement, benchmarking helps companies formulate objectives for continuous improvement programs. But it can also be an effective tool for determining process objectives and identifying innovative process attributes. Insofar as it enables companies to look outside for alternative ways of designing processes, benchmarking can help to break a company's inwardly focused mind-set.

Most appropriate for the purposes of process innovation is a "best practice" or "innovation" benchmark that selects companies on the basis of the performance of a particular process, without regard to the industry, and addresses specific innovations and uses of change enablers as well as overall process performance. A company attempting to innovate its order management process, for example, might study Digital Equipment Corporation's expert systems for automated configuration or USAA's empowered customer service representatives, whereas a firm studying new product development might analyze how J.C. Penney employs videoconferencing to place new fashion designs in stores. Benchmarking can identify realistic performance objectives and target characteristics for companies to match or surpass, information that can be used during innovation brainstorming workshops to fuel the redesign process.
Innovation benchmarking need not focus on the traditional concerns of benchmarking. Process measures and costs may help to establish objectives for a new process, but even a poorly performed process in a poorly performing company can have innovative aspects. It is also important to benchmark distinctive uses of enablers and innovative work designs. Even relatively narrow aspects of processes can be worthy of analysis. Several firms that are redesigning their order management processes, for example, have visited a division of AT&T in which field personnel use laptop computers and portable networking to work without offices. This innovation, although it does not comprise a complete process, can be an important component of an order management approach.

Other industry innovations should not be neglected in formulating the objectives and attributes of a process vision, but managers may be more readily disposed to adopt innovations for which there is evidence of use in their own industry. Benchmarkers must therefore strike a balance in presenting valuable cross-industry innovations and clearly competitive, relevant-within-industry innovations likely to gain quick acceptance.

The sources of benchmarks are varied, ranging from company visits to telephone discussions with consultants and executives in other firms to industry publications and academic case studies. Because third-party accounts of process innovations may gloss over important issues or stop short of the final chapters of a story, a company is wise to contact benchmarked organizations directly at some point in the benchmarking process. Details of benchmarking, such as the etiquette of contacting firms, are similar for quality and innovation-oriented benchmarking (see Camp for specifics).

**Linking Strategy and External Information to Produce Process Visions**

Strategy, customer perspectives, and external benchmarks are necessary, but not sufficient, to establish the context for process innovation. For a process to be transformed, the context must be made explicit and operational through a set of visions that define the desired process functionality, specify change objectives for the redesign of the process, and identify qualitative attributes...
of the process's future state. These visions provide necessary direction for the design team.

Process visions link strategy and action; they translate high-level strategies into measurable targets for process performance and understandable characteristics of process operations, and they set targets both for the designers of a process and for those who must subsequently manage it. Just as analysis of corporate strategy is combined with information from external sources to create process visions, so process visions give rise to objectives and attributes (see Figure 6-2).

**Formulating Process Objectives**

Process objectives include the overall process goal, specific type of improvement desired, and numeric target for the innovation, as well as the time frame in which the objectives are to be accomplished. Both general process functionality and change goals should be addressed by these objectives.

Process objective creation begins with a vision team asking itself, and key stakeholders, "What business objective is this process supposed to accomplish?" This analysis should broadly address

![Figure 6-2 Strategies, Visions, Objectives, and Attributes](image-url)
the functions and value the process is expected to bring customers. To avoid what Ted Levitt has called "marketing myopia," it should concern itself not only with traditional outputs of the process, but also with real customer needs. A team redesigning a company's order management process might discover, for example, that its customers need additional services to take better advantage of the company's products, or customers might be interested in purchasing products in a less-finished state. The analysis should also address the aspects of the business that are most important to customers. Firms sometimes find that they are focusing on one process objective when another is more important to customers—for example, stressing product variety when customers want faster, more reliable delivery, or striving for cost reduction when customers would willingly pay more for a better product or service.

Process objectives must be quantified as specific targets for change. Examples of quantitative process objectives for various industries might include:

- reduce new drug-development cycle time by 50% in three years;
- double customer service satisfaction levels in two years;
- reduce involuntary employee turnover to 10% by the end of the next fiscal year; and
- reduce processing costs for customer orders by 60% over three years.

Process objectives should be derived from strategy. Continental Bank's strategy of being a business bank led naturally to a process objective of doubling relationship managers' time spent with customers. Although this objective was appropriate, the executive who "owned" customer contact (now CEO of another bank) chose not to publicize it to the relationship managers.

Rank Xerox U.K.'s process vision was not so easily derived from its strategy of selling systems rather than copiers. The strategy applied to numerous different processes and was difficult to translate into specific redesign goals for any one. The substantial benefits realized from the first round of process redesign (e.g., reducing jobs not involved in customer contact and reducing order delivery time from 33 to 6 days), did not reflect the level of business change desired by the senior management team. Consequently, the company is undertaking a second round of process
innovation in which the objectives are more specific and more closely tied to current strategy. This round should be much easier than the first, because the company now has a strong process orientation.

Process objectives, like strategies, should meet a number of established criteria. For example, the level of change targeted should be radical. This usually means greater than 50% improvement. Some firms have much more ambitious goals. IBM, for example, is attempting to reduce time, cost, and defects by a factor of 10 by 1992 and by a factor of 100 by 1995. However unlikely the achievement of these goals for most processes, establishing them has clearly stimulated a great deal of work by process design teams, and some improvement is certain to be achieved.

Developing Process Attributes

Process attributes, the descriptive, nonquantitative adjunct to process objectives, constitute a vision of process operation in a future state. They address both high-level process characteristics and specific enablers. Process attributes for an order management process, for example, might specify that the process will employ expert systems-based credit checking, automated proposal generation, increased worker empowerment, and a financial structure resembling dealerships for customer-facing teams. Other attributes might specify that the process be performed by one person or team, and that credit, shipping, and scheduling functions will be performed by the customer-facing individual. It is sometimes useful to categorize attributes as "technology," "people," "process outputs," and so forth.

Process attributes might be considered principles of process operation. Like principles, they are simple statements that describe an organization’s philosophy and intent regarding process operations and can be an effective means of engaging senior managers in discussions about visions for new processes.

The enablers of process innovation that have been identified as relevant in earlier stages of the innovation initiative also become attributes of the process. These may involve information, information technology, or organizational and human factors.

An example of an organizational attribute is to collapse the division of labor in a process, that is, to organize it in such a way that the entire process is overseen by a single employee or group.
In many banks, for example, relationship managers are responsible for handling all aspects of a customer relationship, and many hospitals employ case managers to coordinate all aspects of a patient's stay.

An example of a human factors attribute is to push decision making down in the organization. One manufacturer that had made pricing decisions the responsibility of the division general manager moved that decision making down in the organization to cross-functional product development teams; in doing so, it realized overall cycle-time improvements. Other companies, by applying this attribute, have eliminated layers of management and hierarchy.

A common technology-oriented attribute is the offloading, whenever possible, of process activities to process customers by giving them access to the provider's computer systems. One future vision of Federal Mogul's customer-driven product development is to allow customers to examine its on-line product catalog to determine whether an existing product might satisfy their requirements, an activity currently performed by product engineers. Federal Express and other firms in the shipping industry have given customers terminals to check the progress of parcel shipments.

These are only a few examples of attributes that might be employed within process visions. The enablers selected by a design team, along with inputs from customers, external benchmarking partners, and the business strategy, should suggest many more.

When NCR reengineered its order management process in 1988, a set of attributes (called "goal states" by NCR) were developed as part of the visioning activity. Managers of the initiative credited the goal states with presenting "a case for action" and being a vehicle for achieving buy-in by process owners and participants. Among the 20 attributes (some were really performance objectives) they declared were the following:

- link order management systems worldwide, but keep them local;
- create automated sales assistant tools for product information and pricing;
- offer direct shipments from manufacturing to customers—no warehouses; and
• render invoices and payments electronically.

Since the original attributes were defined at NCR, they have continued to evolve. As the envisioned process was implemented, both the business and relevant technology continued to change; it was only natural that the process attributes would also change through the implementation period.

The Visioning Process

Process objectives and process attributes are derived from multiple sources—among them, analyses of corporate strategy and vision, high-level overviews of the roles of technology and people (as both opportunities and constraints), customer interviews, benchmarking of the best processes in other companies, and a firm's performance objectives—during visioning sessions at the beginning of a specific process initiative.

These visioning sessions should be a series of workshops, with increasing specificity about the vision at each step (see Figure 6-3). In earlier stages of the process, the focus is on attributes and objectives, as described above. After these have been articulated, later workshops can address the critical factors for the successful implementation of the vision, and any barriers that might stand in the way.

Regardless of the topic focus, all aspects of the vision must be stated with a high degree of specificity. The specificity of process visions is the source of both their power and their difficulty. Specific attributes and measurable objectives are powerful because they clearly express the purpose of process innovation efforts. But because they may be formulated well before the process team begins detailed analysis of the existing process, they are difficult to formulate with accuracy, and they rely on prediction more than precision. A process vision should therefore be determined on the basis of what is necessary from a business standpoint, rather than what seems reasonable or accomplishable.

Process objectives should be stretch targets for an organization. Unless their reach seems to exceed an organization's grasp, they will not motivate design teams to go beyond incremental improvement. An improvement objective of 10% permits a team to streamline a process—to eliminate a step here, a person there.
Specifying an objective of 100% improvement ensures that a process will be examined with an eye toward radical change. The purpose of stretch targets is primarily behavioral—to let designers and implementers know that innovation and creativity are expected. To target low levels of improvement, or to say, "Let's just look at the process and see what we can get," is to invite marginal improvement at best.
A vision must not be completely unrealizable. A design team that perceives, for example, that a stretch objective cannot be achieved—either because it is unreasonable or because environmental constraints are too great—becomes disillusioned, a lesson learned in research on high-commitment organizations. 20

Process objectives and attributes are important not only for new, but also for existing processes. As explained in the next chapter, it is important to understand an existing process before designing a new one. This understanding must include measurement of the aspects of the process upon which the new process is to improve, and comparisons of the attributes of the old and new processes. Without an explicit process vision for a new process, it is difficult to know what to examine in the old one. "Safe" measures, such as the cost of and time consumed by an old process, should not be examined to the neglect of other, more vision-specific measures.

Process visions are a means of enabling some degree of wider participation in an activity that needs to be driven from the top of the organization. They place on the shoulders of lower-level members of process teams the work of designing new processes to achieve objectives and attributes clearly stated by senior management. Because process team members are typically drawn from corporate staff and middle management groups, it is not accurate to refer to process implementation as "top-down vision, bottom-up implementation"; at best, implementation is "middle up." The middle ranks of an organization will also be responsible for managing the new process to achieve full benefits.

Process visions and the strategies that support them are key elements of a context for process innovation. Like other aspects of management practice, clear strategies and visions are a good idea for all companies, but they are essential to process innovation.

Senior management plays an important role in creating process visions. The foundation of Hallmark's innovation efforts is a vision of the company's ideal future state as articulated by its top 40 managers.21 Process innovation teams at Xerox are guided by Xerox 2000, a corporate, high-level description of core competencies for the millennium developed by senior management, with strategic goals for specific process initiatives supplied by divisional management. Some senior managers must be participants in process visioning activities; others must be aware of the process visions that result.
Summary

The creation of process visions relies on assessing an organization's strategy, gathering external inputs into process design and performance, and translating this information into specific process objectives and attributes. The relationships among these factors must not be one-way. Lessons learned through process innovation should influence strategy. If process orientation is to become a key determinant of how business is conducted, results of process management should feed back into all aspects of the organization. Strategies should eventually be phrased in terms of which processes must be changed, and their success measured through process-generated information. Objective setting should be tied to results achieved in previous processes.

As firms become more comfortable and experienced with information and information technology as enablers of process innovation, strategies and objectives should shift to better exploit these competitive resources. Information management, when it becomes a core competence, opens entirely new competitive alternatives, including the sale of information, information management services, and alternative products through information-based channels.

Thus far, we have focused primarily on shaping designs for new ways of doing business. But the current process must also be the focus of analysis, both in terms of understanding and measurement and in terms of short-term improvement. It is to this that we turn in the next chapter.

Notes


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Notes


17 Though innovation initiatives exist for these 18 processes, there are some signs that IBM is beginning to focus its major initiatives on a smaller number of processes.


Chapter 7
Understanding and Improving Existing Processes

It is important to understand an existing process before designing a new one. Some approaches to process redesign and reengineering do not include this step, and some companies have omitted it in their process innovation initiatives—to their regret. One process team at a large telecommunications firm, for example, estimates that not taking the time to understand an existing process left it unable to establish the benefit of adopting the new process. The team found it difficult to get funding for the initiative, re-suiting in an 18-month delay.

There are at least four reasons to document existing processes before proceeding with innovation. One, understanding existing processes facilitates communication among participants in the innovation initiative. Models and documentation of current processes enable those involved in the innovation activities to develop a common understanding of the existing state. This aspect is particularly important in the case of business and management processes performed by professionals or other employees engaged in relatively unstructured, nonroutine work, which such individuals find difficult to view as a process.

For example, a large defense contractor attempting to innovate its information-systems development processes was unable to get its professionals to recognize (or admit) that a process underlay the work they performed. The firm was forced to use an incremental improvement approach to the development activities, with no process context or measurement of either current or improved activities. The merchant banking group of a major investment bank wanted to take a process perspective to define more systematic ways of identifying new business opportunities after investment opportunities took a downward turn in the late 1980s.
Ironically, there is less to say about the design phase of process innovation than about the activities that lead up to it. The design activity is largely a matter of having a group of intelligent, creative people review the information collected in earlier phases of the initiative and synthesize it into a new process. There are techniques for facilitating the review process, but the success or failure of the effort will turn on the particular people who are gathered together.

The choice of participants for a new process design team should be governed by both design and implementation considerations. A balance must be struck between team members who can deliver the most creative and innovative process solutions and those who can help to ensure that they are implemented.

Although in most organizations, the same individuals who participated in the process selection and visioning phases will participate in the design phase, it is particularly important that key process stakeholders feel their interests are represented during the latter phase. Stakeholders who should participate on the team during the design phase include heads of key functions intersected by the process, key general managers with operational responsibility for the process, suppliers of important change resources (e.g., the IT, human resource, and financial functions), and process customers and suppliers, both internal and external. It is worth noting that a number of consumer goods manufacturers, among them Procter & Gamble, Scott Paper, and Black & Decker, invited a few large retailers to participate in the redesign of their order management processes for quick response and continuous replenishment. In fact, exclusion of important customers...
such as Wal-Mart from the design phase would be virtually unthinkable. Inclusion make a design team unwieldy, but time lost achieving large group consensus can implementation times.

Our discussion here covers the implementation of new process designs, including and the implementation of new organizational structures and systems designed to ways of working. Key activities in the design phase are listed in Figure 8-1.

**Brainstorming Design Alternatives**

Design innovation is best accomplished in a series of workshops, and brainstormi surfacing creative process designs. By brainstorming, we refer to any group faci that encourages participation from all group members, regardless of their roles an organization. Emphasis during brainstorming sessions should be on creativity and judgmental atmosphere is essential. Any idea should be fair game, and participant can share their thoughts without risk. The objective of brainstorming sessions is t pragmatic new process designs, taking as input the process vision, change enable knowledge developed in the earlier phases of process innovation.

Graphic representation of a process design can be extremely helpful in understan of computer-based tools for design display and simulation is discussed in a later c technological approaches can also be very useful.

**Figure 8-1 Key Activities in Designing and Prototyping a New Process**

- Brainstorm design alternatives
- Assess feasibility, risk, and benefit of design alternatives and select the pre
- Prototype the new process design
- Develop a migration strategy
- Implement new organizational structures and systems
Firms have successfully employed large whiteboards and large pieces of colored affixed to walls. Most computer-based tools use a rigorously defined set of symbols different process entities, but these are not essential. The primary purpose of the is communication and recording, and any consistent set of easily understood symb

It is often useful to define the new process in an iterative fashion, with greater detail successive level (see Figure 8-2). To begin with, a high-level flow of the overall process should be created. This should not be difficult, given a well-articulated process vision. At the level, each subprocess can be described with roughly the same thoroughness describing the general process in the first iteration. Finally, each major activity should be described in terms of such factors as who will perform it, the information needed and so forth. For the sake of coherence and consistency, different graphic icons should be used to portray each level.

<table>
<thead>
<tr>
<th>Process Level (Icons)</th>
<th>Subprocess Level (Boxes)</th>
<th>Activity Level</th>
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<tbody>
<tr>
<td>• Inputs</td>
<td>• Objective</td>
<td>• Information</td>
</tr>
<tr>
<td>• Outputs</td>
<td>• Performance Metrics</td>
<td>• Decision Poi</td>
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<tr>
<td>• Interfaces</td>
<td>• Who Performs</td>
<td>• Who Does It</td>
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<td>• Flow</td>
<td>• IT Enablers</td>
<td>• Value-Add</td>
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<tr>
<td>• Measures</td>
<td>• Information Needs/Activities</td>
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<td></td>
<td>• Value-Added (prerequisites)</td>
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<td>• Activities in the Process (narrative)</td>
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</tbody>
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Figure 8-2
Levels of Process Design
Assessing Feasibility, Risk, and Benefits

The minds of design team participants should be full of information as the design activity begins. Participants should be well versed in the high-level vision for the process, including performance objectives and attributes, and be aware of opportunities and constraints presented by likely enablers, both technological and human/organizational, of the target process. They should be familiar at least with the broad performance parameters of the current process. Analysis of the current process need not be rigorous, but high-level aspects of the analysis should be inputs to the design deliberations.

Brainstorming sessions usually produce a number of design alternatives, which must be submitted to feasibility analyses to evaluate their relative benefits, costs, risks, and time frames. The new design and current state must be compared in terms of structure, technology, and organization to fully understand the implications of each alternative. The results of these analyses provide the basis for selecting the optimum design.

Prototyping the New Process

Developing a prototype is a way to simulate and test the operation of a new process. It is an iterative process in which the fit between new process structure, information technology, and organization is refined and re-refined. A prototype might be considered the analog of a scientific experiment performed in a laboratory setting. Our definition is a small-scale, quasi-operational version of a new process that can be used to test various aspects of its design. This kind of prototype is known as an organizational prototype.²

There is no way to predict the organizational impact of a redesigned process and associated information technology with complete accuracy. The goal of the prototyping is to gradually shape the organizational environment or, alternatively, to revise the technology. Prototyping must be viewed as a learning activity by process designers and users alike. Many iterations may be necessary to achieve a proper fit; thus, the need to reiterate must not be viewed as failure.

A new process for taxpayer collections that was not prototyped by the Internal Revenue Service, although far superior to the old
process and well supported by a new information system, had an unanticipated and negative impact on workers and supervisors. Workers were forced to spend all their time at their terminals or on the phone, supervisors to spend all their time monitoring workers. Both resigned in large numbers, forcing the IRS to reevaluate the new process and job roles. Eventually, it was necessary to spend more than a million dollars to modify the systems to support a team-based rather than individual process design.

Prototyping can itself be viewed as a series of phases that yield increasing degrees of tangibility (see Figure 8-3). Computer simulation, one of the techniques discussed later, is a kind of limited process prototyping, beyond which it may be reasonable to create a paper-based information test of the process. In subsequent phases, the prototype might be taken to a stand-alone process test, using personal computers for information support, and interfaces to other processes and existing information systems might then be added to it. The ultimate prototype would include all enabling technologies, skills, and organizational structures. Each phase helps refine the process design and the information required to support it; taken together, these phases help reduce implementation risk.

![Levels of Process Prototyping](image-url)
Phases of Prototyping

A videotape that illustrates a new process can be useful for persuading customers to change interfacing processes and senior managers to fund implementation of the new process. Seeing a process on tape lends it a tangibility that paper reports and third-hand discussions seldom achieve.  

Clearly the organizational learning perspective needs to extend beyond prototyping. It sometimes takes a few cycles to arrive at an effective process design. IBM Credit Corporation, for example, has implemented a number of different process designs over the past five years. When desired objectives were not obtained, it tried again. In fact, one of the lessons managers at IBM Credit have learned is that process innovation never really ends. Having achieved tenfold improvements in cycle time and quote volume, the organization is attempting to push process performance into the field to achieve even greater benefits.

Migrating to a New Process

Having designed and tested a prototype process, an organization faces the considerable challenge of migrating from the current process environment to the radically new design. A full "cutover" may be difficult or impossible. If the new process involves customers, revenues, or valued employees, or if the process change will be highly visible internally or externally (and for what important process are these conditions not true?), the firm may not want to risk an abrupt transition. Alternatives to full cutover include phased introduction, creating a pilot, or creating an entirely new business unit.

A pilot is a smaller scale, but fully operational, implementation of a new process in a relatively small unit of the organization based on a particular geography, product, or set of customers. Although pilots are often viewed as a means of testing a new process (or other type of intervention), the goal should be to achieve success rather than merely objectively test. Thus, the unit selected should be the one most capable of achieving successful change.

One migration approach is to begin with a pilot and follow with a phased introduction. A firm might, for example, implement new systems capabilities and skills as they become available. A phased approach may be the most economically feasible, in that
companies can derive some financial benefit from the process change earlier than might otherwise be possible; it is not, however, necessarily less disruptive than a full cutover. In fact, the sense of constant change and instability may be difficult for some employees to handle.

If constraints within the existing environment are too great, it may be desirable to create a new organization for the new process. This organization can run parallel to the existing one and be the locus of specific products, channels, or customers. The most prominent example of process innovation in the banking industry involved establishing a new organization. Midland Bank in the United Kingdom established an organization called First Direct to service retail customers without normal branches or other “bricks and mortar.” The new bank employs innovative customer service processes that rely on the telephone and automated teller machines. It also makes extensive use of information technologies to identify patterns of customer behavior that reflect credit risk. Because its processes do not involve expensive real estate, First Direct can offer 24-hour service and higher interest rates that compete with Midland’s more traditional banking organization as well as with other U.K. banks.

Implementing New Organizational Structures and Systems

Firms and organizations today tend to be structured in a way that works against the success of their new process designs. Most organizational structures are based either on function or product, with little or no process orientation. Functionally organized firms have difficulty meeting customer needs seamlessly across different functions because no one “owns” the issue of how long it takes or how much it costs to fulfill customer requests. Certain key processes—typically new product development and order management—cross so many parts of the organization that the only manager to whom all their activities report is the CEO.

A firm organized around product structure has a difficult time ascertaining total business done with individual customers or “cross-selling” different products to the same customer. The latter problem is particularly pressing in banks, which, being organized around product lines (for example, many have a trust system for trust customers, a demand deposit accounting system for checking...
account customers, a consumer loans system for consumer loan customers, and so forth) are encountering severe problems establishing integrated customer databases.

A number of banks, including Continental and Chemical, are attempting to impose an “overlay” architecture that would enable a customer relationship manager to reach into the various databases in which customer information is contained to create a composite customer file. But until the basic organizational structure is no longer product-driven, this activity will be contrary to the systems, reporting responsibilities, and culture of the bank.

Although the problem of rigid functional organizations is widely recognized, the proposed solution—to abandon any form of structure beyond the self-managing team—is frequently worse than the problem, or at least much less well defined. We cannot imagine that real firms will abandon structure to the degree suggested by the set of concentric circles, the orchestra, or something else, or that they would be effective if they did so. We are, Elliot Jacques has noted, creatures of structure, and have been since the beginning of formal organization. A more process-based, rather than post-structural, organization offers a powerful compromise between the need to maintain structure and the desire to adopt a flexible approach to the way work is done. Until a process-based organization is established, a new design for work cannot be considered fully implemented.

We do not recommend that processes become the only basis for organizational structure. Functional skills are important to a process orientation, as is concern for product management and the running of strategic business units. Most firms are well advised to adopt a multidimensional matrix structure, with process responsibility as a key dimension. An organization that wishes to benefit from a process perspective must be prepared to tolerate the well-known problems with matrix structures, including diffusion of responsibility, unclear reporting relationships, and excessive time spent in coordination activities and meetings.

There is another reason a purely process-oriented structure will not solve all structural problems. Firms such as IBM and Xerox, which are vigorously pursuing multiple process innovation initiatives, have made interesting observations about structure. Just as key activities can fall between the cracks of functions, important activities can fall between the cracks of processes, even broadly defined processes. If organizations converted fully to
process-based structures, some future researcher would undoubtedly speak of the need for cross-process integration. Multiple dimensions of structure can help bridge the gaps created by a single structural dimension.

But only when firms adopt more process-based organizational structures will processes be managed in congruence with other aspects of the organization. Then, instead of cutting across the organization, process responsibilities will be a key focus of the organization. Process ownership, rather than constituting a "shadow" organization, as some companies have referred to it, will be a primary dimension of reporting and performance measurement.

In effect, a process-based organizational structure is a structure built around how work is done rather than around specific skills. A number of organizational theorists have argued that organizations need to reduce their levels of hierarchy and adopt action-based rather than formal structures. A process-based structure combines an action orientation with some degree of formal structure.

There is a harbinger of the effectiveness of process-based structures in the way several Japanese automobile manufacturers approach product development. Kim Clark and Takahiro Fujimoto have described the concept of the "heavyweight product manager" in these firms. This role has coordination responsibility for product development from concept to market, across such functional areas as engineering, manufacturing, marketing, and sales. Although relatively high in the organizational hierarchy, the heavyweight product manager exercises relatively direct influence over the activities of engineers at the worker level.

Although Clark and Fujimoto do not take an explicit process perspective, the heavyweight product manager role might be equated to ownership of the product development process. Only through such a role can companies develop products as complex as the modern automobile with speed, efficiency, and design and marketing coherence.

Yet we know of no Western organization that has made radical strides toward a process-based structure. Most companies that have undertaken substantial process innovation initiatives have simply imposed process management as an additional dimension of structure—on top of the existing dimensions—assigning process ownership to managers who may also have functional and/or
product responsibilities. In almost none of these firms has process responsibility been accorded organizational legitimacy.

The hesitation to move to process-based structures goes beyond simple unfamiliarity with process as an organizational unit. When asked why they were reluctant to move toward process-based structures, process-oriented managers offered, among other reasons:

- concern that the level of organizational change from process innovation is already high and converting to a process-based organization might constitute too much change;

- fear that if functions are no longer the primary basis of organization, functional skills will be lost; and

- a belief that process is an unstable basis for organization because processes change more quickly than functions.

Only the first objection, we believe, has any real merit. Although it may be more difficult to preserve strong functional skills in a process-based organization, it seems quite possible. Marketing research skills, for example, are just as important to a product development process as they are to a marketing function. But because such skills may be spread throughout several processes, there must be structural or systemic approaches to nourishing and preserving them. With regard to the stability of processes, the premise of the objection may be valid, but not the conclusion. The fact that processes may change often to better meet customer needs is not an argument for abandoning them as a basis for organization. In fact, many organizational theorists have argued that a more dynamic basis of organization is exactly what is needed.

Only the concern that changes in organizational structure—on top of organizational changes imposed by process innovation—might be too much change all at once is well founded. Companies can begin their process innovation initiatives with shadow process organizations, and then slowly migrate toward a full process-based structure. As Beer et al. have observed, a congruent organizational structure is important, but many companies too quickly create new structures in major change programs rather than address organizational development and individual behavioral change first. The timing and management of the change
considerations involved in moving to a process structure are explored further in the next chapter.

**Beyond Process Design**

The innovation approach outlined in the last several chapters is only the first step toward full-scale implementation of new processes. The complete innovation cycle is depicted in Figure 8-4. Innovation and the creation of a new organizational structure must be followed by detailed systems design, development of new performance measurement systems and skills, and systems construction and deployment. A fully implemented process innovation occurs over several years, and although our approach is outlined as a sequential process, it should, in fact, be executed in a highly iterative fashion. Rigid partitioning of the activities will not yield the maximum benefits of innovation.

![Diagram of the Process Innovation Cycle]

Companies involved in process innovation initiatives often act as if the most difficult aspect of the effort is over when the new process design has been developed. But realization of process innovation benefits is not, at this stage, a fait accompli. Like those of any other innovation, the benefits of process innovation appear gradually in response to active management. A number of companies, including Sea-Land and Du Pont, employ specially designated teams to follow innovations well after implementation in order to determine whether benefits from IT-enabled business changes are being realized. Although such teams typically do not take a process perspective, the concept of benefit management and post-implementation assessment would be facilitated by process thinking, with its emphasis on measurement and outputs.

**Notes**


3 I am grateful to Professor James Cash of Harvard Business School for this suggestion.


