chapter 1

Business Process Change

THIS CHAPTER PROVIDES a brief history of corporate business process change initiatives. Individuals working in one tradition, whether BPR, Six Sigma, or ERP, often imagine that their perspective is the only one, or the correct one. We want to provide managers with several different perspectives on business process change in order to give everyone an idea of the range of techniques and methodologies available today. In the process we will define some of the key terms that will occur throughout the remainder of the book.

People have always worked at improving processes. Some archaeologists find it useful to organize their understanding of early human cultural development by classifying the techniques and processes that potters used to create their wares. In essence, potters gradually refined the pot-making process, creating better products, while probably also learning how to make them faster and cheaper.

The Industrial Revolution that began in the late 18th century led to factories and managers who focused considerable energy on the organization of manufacturing processes. Any history of industrial development will recount numerous stories of entrepreneurs who changed processes and revolutionized an industry. In the introduction we mentioned how Henry Ford created a new manufacturing process and revolutionized the way automobiles were assembled. He did that in 1903.

In 1911, soon after Henry Ford launched the Ford Motor Company, another American, Frederick Winslow Taylor, published a seminal book: *Principles of Scientific Management.* Taylor sought to capture some of the key ideas that good managers used to improve processes. He argued for simplification, for time studies, for systematic experimentation to identify the best way of performing a task, and for control systems that measured and rewarded output. Taylor's book became an international bestseller, and many would regard him as the father of operations research, a branch of engineering that seeks to create efficient and consistent processes. From 1911 on, managers have sought ways to be more systematic in their approaches to process change.

New technologies have often led to new business processes. The introduction of the train and the automobile, and of radio, telephones, and television, have each led to new and improved business processes. Since the end of World War II, computers and software systems have provided a major source of new efficiencies.

Two recent developments in management theory deserve special attention. One was the popularization of systems thinking, and the other was the formalization of the idea of a value chain.

Organizations as Systems

Many different trends led to the growing focus on systems that began in the 1960s. Some derived from operations research and studies of control systems. Some resulted from the emphasis on systems current in the computer community. Today's emphasis on systems also arose out of contemporary work in biology and the social sciences. At the same time, however, many management theorists have contributed to the systems perspective. One thinks of earlier writers like Ludwig von Bertalanffy, Stafford Beer, and Jay W. Forrester and more recent management theorists like John D. Sterman and Peter M. Senge.

In essence, the systems perspective emphasizes that everything is connected to everything else and that it's often worthwhile to model businesses and processes in terms of flows and feedback loops. A simple systems diagram is shown in Figure 1.1.

The idea of treating a business as a system is so simple, especially today when it is so commonplace, that it is hard for some to understand how important the idea really is. Systems thinking stresses linkages and relationships and flows. It emphasizes that any given employee or unit or activity is part of a larger entity and that ultimately those entities, working together, are justified by the results they produce.

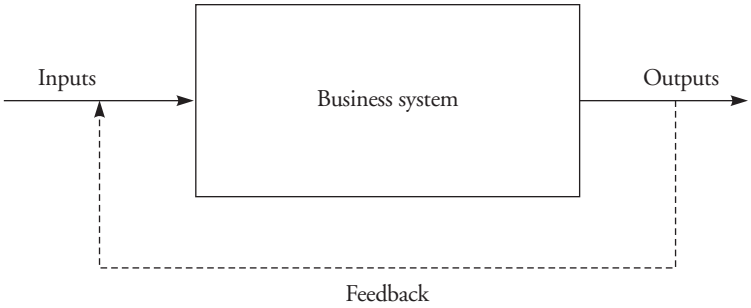

Figure 1.1 A business entity as a system.

To make all this a bit more concrete, consider how it is applied to business processes in the work of Michael E. Porter.

Systems and Value Chains

The groundwork for the current emphasis on comprehensive business processes was laid by Michael Porter in his 1985 book, *Competitive Advantage: Creating and Sustaining Superior Performance.* Porter is probably best known for his earlier book, *Competitive Strategy*, published in 1980, but it's in *Competitive Advantage* that he lays out his concept of a *value chain*—a comprehensive collection of all of the activities that are performed to design, produce, market, deliver, and support a product line. Figure 1.2 shows the diagram that Porter has used on several occasions to illustrate a generic value chain.

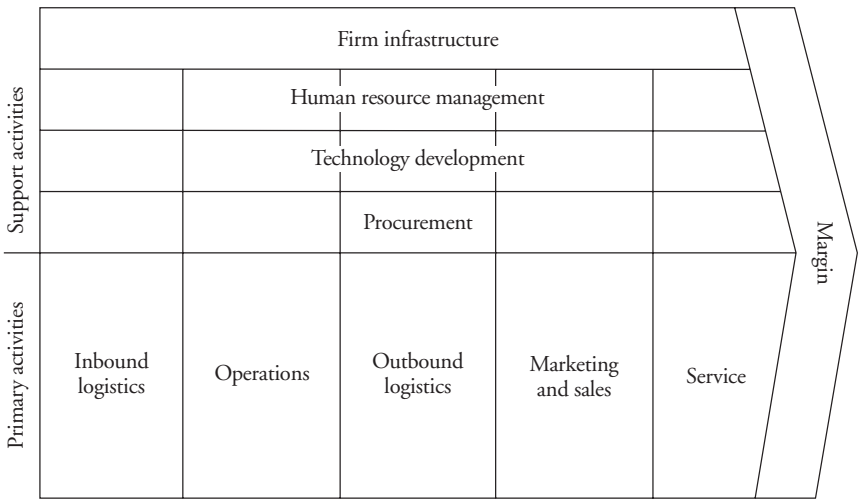

Figure 1.2 Michael Porter's generic value chain.

Although Porter doesn't show it on this diagram, you should assume that some primary activity is initiated on the lower left of the diagram when a customer orders a product, and ends on the right side when the product is delivered to the customer. Of course it may be a bit more complex, with marketing stimulating the customer to order and service following up the delivery of the order with various services, but those details are avoided in this diagram. Figure 1.2 simply focuses on what happens between the order and the final delivery—on the value chain or large-scale business process that produces the product. What's important to Porter's concept is that every function involved in the production of the product, and all of the support services, from information technology to accounting, should be included in a single value chain. It's only by including all of the activities involved in producing the product that a company is in position to determine exactly what the product is costing and what margin the firm achieves when it sells the product.

As a result of Porter's work, a new approach to accounting, *Activity-Based Costing* (ABC), has become popular and is used to determine the actual value of producing specific products.

When Porter's concept of a value chain is applied to business processes, a different type of diagram is produced. Figure 1.3 illustrates a value chain or business process that cuts across five departmental or functional boundaries, represented by the underlying organizational chart. The boxes shown within the process arrow are subprocesses. The subprocesses are initiated by an input from a customer, and the process ultimately produces an output that is consumed by a customer. As far as I know, this type of diagram was first used by another management systems theorist, Geary Rummler, in 1984.

Geary Rummler was the second major business process guru of the 1980s. With a background in business management and behavioral psychology, Rummler worked for years on employee training and motivation issues. Eventually, Rummler and his colleagues established a specialized discipline that is usually termed *Human Performance Technology* (HPT). Rummler's specific focus was on how to structure processes and activities to guarantee that employees—be they managers, salespeople, or production line workers—would function effectively. In the 1960s and 1970s he relied on behavioral psychology and systems theory to explain his approach, but during the course of the 1980s he focused increasingly on business process models.

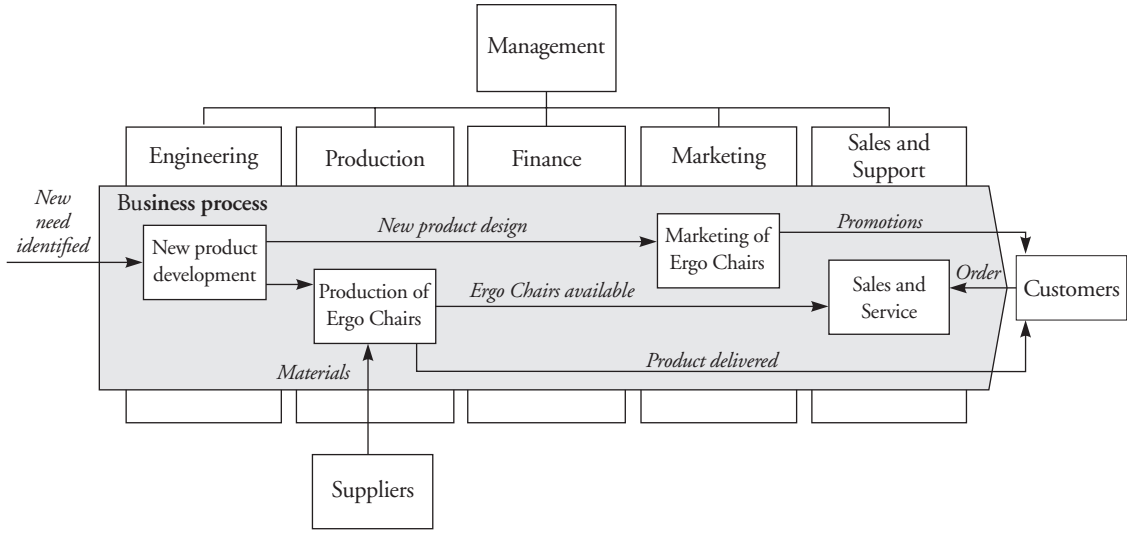

Figure 1.3 A business process cuts across traditional departments to combine activities into a single process flow. (After Rummler, 1984.)

At the end of the eighties Rummler and a colleague, Alan Brache, wrote a book, *Improving Performance: How to Manage the White Space on the Organization Chart*, that described the approach they had developed while consulting on process improvement during the course of the eighties. Rummler focused on organizations as systems and worked from the top down to develop a comprehensive picture of how organizations were defined by processes and how people defined what processes could accomplish. He provided a detailed methodology for how to analyze an organization, how to analyze processes, how to redesign and then improve processes, how to design jobs, and how to manage processes once they were in place. The emphasis on "the white space on the organization chart" stressed the fact that many process problems occurred when one department tried to hand off things to the next. The only way to overcome those interdepartmental problems, Rummler argued, was to conceptualize and manage processes as wholes.

Later, in the nineties, Hammer and Davenport would exhort companies to change and offered lots of examples about how changes had led to improved company performance. Similarly, IDS Scheer would offer a software engineering methodology for process change. Rummler and Brache offered a systematic, comprehensive approach designed for business managers. The book that Rummler and Brache wrote did not launch the BPR movement in the nineties. The popular books written by Hammer

and Davenport launched the Reengineering movement. Once managers became interested in Reengineering, however, and began to look around for practical advice about how to actually accomplish process change, they frequently arrived at *Improving Performance.* Thus, the Rummler-Brache methodology became the most widely used, systematic business process methodology in the mid-1990s.

One of the most important contributions made by Rummler and Brache was a framework that showed, in a single diagram, how everything related to everything else. They define three levels of performance: (1) an organizational level, (2) a process level, and (3) a job or performer level. This is very similar to our levels of concern, except that we refer to level 3 as the implementation level to emphasize that an activity can be performed by an employee doing a job or by a computer executing a software application. Otherwise, our use of levels of concern in this book mirrors the levels described in Rummler-Brache in 1990.

Rummler and Brache also introduced a matrix that they obtained by crossing their three levels with three different perspectives. The perspectives are goals and measures, design and implementation issues, and management. Figure 1.4 illustrates the matrix. Software architects today would probably refer to it as a framework. The important thing is that it identifies nine different concerns that anyone trying to change processes in an organization must consider. Approaches that focus only on processes or on performance level measures or on process management are limited perspectives.

	Goals and measures	**Design and implementation**	**Management**
Organizational level	Organizational goals and measures of organizational success	Organizational design and implementation	Organizational management
Process level	Process goals and measures of process success	Process design and implementation	Process management
Activity or performance level	Activity goals and measures of activity success	Activity design and implementation	Activity management

Figure 1.4 A performance framework (modified after a figure in Rummler and Brache's *Improving Performance*).

Notice how similar the ideas expressed in the Rummler-Brache framework are to the ideas expressed in the SEI Capability Maturity Model we considered in the introduction. Both seek to describe an organization that is mature and capable of taking advantage of systematic processes. Both stress that we must be concerned not only with the design of processes themselves, but also with measures of success and with the management of processes. In effect, the CMM diagram described how organizations evolve toward process maturity, and the Rummler-Brache framework describes all of the things that a mature organization must master.

Mature organizations must align both vertically and horizontally. Activity goals must be related to process goals, which must, in turn, be derived from the strategic goals of the organization. Similarly, a process must be an integrated whole, with goals and measures, a good design that is well implemented, and a management system that uses the goals and measures to assure that the process runs smoothly and, if need be, is improved.

The Rummler-Brache methodology has helped everyone involved in business process change to understand the scope of the problem, and it provides the foundation on which all of today's comprehensive process redesign methodologies are based.

Prior to the work of systems and management theorists like Porter and Rummler, most companies had focused on dividing processes into specific activities that were assigned to specific departments. Each department developed its own standards and procedures to manage the activities delegated to it. Along the way, in many cases, departments became focused on doing their own activities in their own way, without much regard for the overall process. This is often referred to as *silo thinking*, an image that suggests that each department on the organization chart is its own isolated silo.

In the early years of business computing, a sharp distinction was made between corporate computing and departmental computing. A few systems like payroll and accounting were developed and maintained at the corporate level. Other systems were created by individual departments to serve their specific needs. Typically, one departmental system wouldn't talk to another, and the data stored in the databases of sales couldn't be exchanged with data in the databases owned by accounting or by manufacturing. In essence, in an effort to make each department as professional and efficient as possible, the concept of the overall process was lost.

The emphasis on value chains and systems in the 1980s and the emphasis on business process reengineering in the early 1990s was a revolt against excessive departmentalism and a call for a more holistic view of how activities needed to work together to achieve organizational goals.

The Six Sigma Movement

The third main development in the 1980s evolved from the interaction of the Rummler-Brache approach and the quality control movement. In the early 1980s, Rummler had done quite a bit of consulting at Motorola and had helped Motorola University set up several courses in process analysis and redesign. In the mid-1980s, a group of quality control experts wedded Rummler's emphasis on process with quality and measurement concepts derived from quality control gurus W. Edwards Deming and Joseph M. Juran to create a movement that is now universally referred to as Six Sigma. Six Sigma is more than a set of techniques, however. As Six Sigma spread, first from Motorola to GE, and then to a number of other manufacturing companies, it developed into a comprehensive training program that sought to create process awareness on the part of all employees in an organization. Organizations that embrace Six Sigma not only learn to use a variety of Six Sigma tools, but also embrace a whole culture dedicated to training employees to support process change throughout the organization.

Prior to Six Sigma, quality control professionals had explored a number of different process improvement techniques. ISO 9000 is a good example of another quality control initiative. This international standard describes activities organizations should undertake to be certified ISO 9000 compliant. Unfortunately, ISO 9000 efforts usually focus on simply documenting and managing procedures. Recently, a newer version of this standard, ISO9000:2000, has become established. Rather than focusing so much on documentation, the new standard is driving many companies to think in terms of processes. In many cases this has prompted management to actually start to analyze processes and use them to start to drive change programs. In both cases, however, the emphasis is on documentation, while what organizations really need are ways to improve quality.

At the same time that companies were exploring ISO 9000, they were also exploring other quality initiatives like statistical process control (SPC), total quality management (TQM), and just-in-time manufacturing (JIT). Each of these quality-control initiatives contributed to the efficiency and quality of organizational processes. All this jelled at Motorola with Six Sigma, which has evolved into the most popular corporate process movement today. Unfortunately, Six Sigma's origins in quality control and its heavy emphasis on statistical techniques and process improvement has often put it at odds with other, less statistical approaches to process redesign, like the Rummler-Brache methodology, and with process automation. That, however, is beginning to

change and today Six Sigma groups in leading corporations are reaching out to explore the whole range of business process change techniques. This book is not written from a traditional Six Sigma perspective, but we believe that Six Sigma practitioners will find the ideas described here useful and we are equally convinced that readers from other traditions will find it increasingly important and useful to collaborate with Six Sigma practitioners.

Business Process Change in the 1990s

Much of the current corporate interest in business process change can be dated from the business process eeengineering (BPR) movement that began in 1990 with the publication of two papers: Michael Hammer's "Reengineering Work: Don't Automate, Obliterate" (*Harvard Business Review*, July/August 1990) and Thomas Davenport and James Short's "The New Industrial Engineering: Information Technology and Business Process Redesign" (*Sloan Management Review*, Summer 1990). Later, in 1993, Davenport wrote a book, *Process Innovation: Reengineering Work through Information Technology*, and Michael Hammer joined with James Champy to write *Reengineering the Corporation: A Manifesto for Business Revolution.*

BPR theorists like Champy, Davenport, and Hammer insisted that companies must think in terms of comprehensive processes, similar to Porter's value chains and Rummler's Organization Level. If a company focused only on new product development, for example, the company might improve the new product development subprocess, but it might not improve the overall process. Worse, one might improve new product development at the expense of the overall value chain. If, for example, new process development instituted a system of checks to assure higher-quality documents, it might produce superior reports, but take longer to produce them, delaying marketing and manufacturing's ability to respond to sudden changes in the marketplace. Or the new reports might be organized in such a way that they made better sense to the new process development engineers, but became much harder for marketing or manufacturing readers to understand.

Stressing the comprehensive nature of business processes, BPR theorists urged companies to define all of their major processes and then focus on the processes that offered the most return on improvement efforts. Companies that followed this approach usually conceptualized a single business process for an entire product line, and ended up with only 5–10 value chains for an entire company, or division, if

the company was very large. The good news is that if companies followed this advice, they were focusing on everything involved in a process and were more likely to identify ways to significantly improve the overall process. The bad news is that when one conceptualizes processes in this way, one is forced to tackle very large redesign efforts that typically involve hundreds or thousands of workers and dozens of major IT applications.

Business process reengineering was more than an emphasis on redesigning large-scale business processes. The driving idea behind the business process reengineering movement was best expressed by Thomas Davenport, who argued that information technology had made major strides in the 1980s, and was now capable of creating major improvements in business processes. Davenport's more reasoned analysis, however, didn't get nearly the attention that Michael Hammer attracted with his more colorful rhetoric.

Hammer argued that previous generations of managers had settled for using information technologies to simply improve departmental functions. In most cases, the departmental functions hadn't been redesigned but simply automated. Hammer referred to this as "paving over cow paths." In many cases, he went on to say, departmental efficiencies were maximized at the expense of the overall process. Thus, for example, a financial department might use a computer to assure more accurate and up-to-date accounting records by requiring manufacturing to turn in reports on the status of the production process. In fact, however, many of the reports came at inconvenient times and actually slowed down the manufacturing process. In a similar way, sales might initiate a sales campaign that resulted in sales that manufacturing couldn't produce in the time allowed. Or manufacturing might initiate changes in the product that made it easier and more inexpensive to manufacture, but which made it harder for salespeople to sell. What was needed, Hammer argued, was a completely new look at business processes. In most cases, Hammer argued that the existing processes should be "obliterated" and replaced by totally new processes, designed from the ground up to take advantage of the latest information system technologies.. Hammer promised huge improvements if companies were able to stand the pain of such comprehensive business process reengineering.

In addition to his call for total process reengineering, Hammer joined Davenport in arguing that processes should be integrated in ways they hadn't been in the past. Hammer argued that the economist Adam Smith had begun the movement toward increasingly specialized work. Readers will probably all recall that Adam Smith

compared data on pin manufacture in France in the late 18th century. He showed that one man, working alone, could create a given number of straight pins in a day. But a team, each doing only one part of the task, could produce many times the number of pins per day that the individual members of the team could produce, each working alone. In other words, the division of labor paid off with handsome increases in productivity. In essence, Ford had only been applying Smith's principle to automobile production when he set up his continuous production line in Michigan in the early 20th century. Hammer, however, argued that Smith's principle had led to departments and functions that each tried to maximize its own efficiency at the expense of the whole. In essence, Hammer claimed that large companies had become more inefficient by becoming larger and more specialized. The solution, according to Hammer, Davenport, and Champy was twofold: First, processes needed to be conceptualized as complete, comprehensive entities that stretched from the initial order to the delivery of the product. Second, Information Technology (IT)[1] needed to be used to integrate these comprehensive processes.

As a broad generalization, the process initiatives, like Six Sigma and Rummler-Brache, that began in the 1980s put most of their emphasis on improving how people performed while BPR, in the 1990s, put most of the emphasis on using IT more effectively and on automating processes wherever possible.

The Role of Information Technology in BPR

Both Hammer and Davenport had been involved in major process improvement projects in the late 1980s and observed how IT applications could cut across departmental lines to eliminate inefficiencies and yield huge gains in coordination. They described some of these projects and urged managers at other companies to be equally bold in pursuing similar gains in productivity.

In spite of their insistence on the use of IT, however, Hammer and his colleagues feared the influence of IT professionals. Hammer argued that IT professionals were usually too constrained by their existing systems to recognize major new opportunities.

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[1] Different organizations use different terms to refer to their information technology (IT) or information systems (IS) or data processing (DP) groups. We'll use these terms and abbreviations interchangeably. In all cases, they refer to the organizational group responsible for analyzing needs, acquiring computer hardware, acquiring or creating computer software, and maintaining the same, or to the systems created and maintained, or to both.

He suggested that IT professionals usually emphasized what couldn't be done rather than focusing on breakthroughs that could be achieved. To remedy this, Hammer and Champy argued that the initial business process redesign teams should exclude IT professionals. In essence, they argue that the initial Business Process Reengineering team should consist of business managers and workers who would have to implement the redesigned process. Only after the redesign team had decided how to change the entire process, Hammer argued, should IT people be called in to advise the team on the systems aspects of the proposed changes.

In hindsight, one can see that the BPR theorists of the early 1990s underestimated the difficulties of integrating corporate systems with the IT technologies available at that time. The BPR gurus had watched some large companies achieve significant results, but they failed to appreciate that the sophisticated teams of software developers available to leading companies were not widely available. Moreover, they failed to appreciate the problems involved in scaling up some of the solutions they recommended. And they certainly compounded the problem by recommending that business managers redesign processes without the close cooperation of their IT professionals. It's true that some IT people resisted major changes, but in many cases they did so because they realized, better than most business managers, just how much such changes would cost. Worse, they realized that many of the proposed changes could not be successfully implemented at their companies with the technologies and manpower they had available.

Some of the BPR projects undertaken in the mid-1990s succeeded and produced impressive gains in productivity. Many others failed and produced disillusionment with BPR. Most company managers intuitively scaled down their BPR efforts and didn't attempt anything as large or comprehensive as the types of projects recommended in the early BPR books.

Misuses of BPR

During this same period, many companies pursued other goals under the name of BPR. Downsizing was popular in the early to mid-1990s. Some of it was justified. Many companies had layers of managers whose primary function was to organize information from line activities and then funnel it to senior managers. The introduction of new software systems and tools that made it possible to query databases for information also meant that senior managers could obtain information without the need for so many middle-level managers. On the other hand, much of the downsizing

was simply a natural reduction of staff in response to a slowdown in the business cycle. The latter was appropriate, but it led many employees to assume that any BPR effort would result in major reductions in staff.

Because of some widely discussed failures, and also as a result of employee distrust, the term "business process reengineering" became unpopular during the late 1990s and has gradually fallen into disuse. As an alternative, most companies began to refer to their current business process projects as "business process improvement" or "business process redesign."

Other Process Change Work in the 1990s

Many of the approaches to business process redesign that emerged in the mid-1990s were driven by software technologies. Some companies used software applications, called *workflow systems*, to automate applications. In essence, early workflow systems controlled the flow of documents from one employee to another. The original document is scanned into a computer. Then, an electronic copy of the document is sent to the desk of any employees who need to see or approve the document. To design workflow systems, one creates a flow plan, like the diagram shown in Figure 1.3, that specifies how the document moves from one employee to the next. The workflow system developers or managers can control the order that electronic documents show up on employees' computers by modifying the diagram. Workflow systems became a very popular way to automate document-based processes. Unfortunately, in the early 1990s, most workflow systems were limited to automating departmental processes and couldn't scale up to the enterprise-wide processes.

During this same period, vendors of off-the-shelf software applications began to organize their application modules so that they could be represented as a business process. In effect, one could diagram a business process by simply deciding how to link a number of application modules. Vendors like SAP, People Soft, Oracle, and J. D. Edwards all offered systems of this kind, which were usually called enterprise resource planning (ERP) systems. In effect, a business analyst was shown an ideal way that several modules could be linked together. A specific company could elect to eliminate some modules and change some of the rules controlling the actions of some of the modules but, overall, one was limited to choosing and ordering already-existing software application modules. Many of the modules included customer-interface screens and therefore controlled employee behaviors relative to particular modules. In essence,

an ERP system is controlled by another kind of "workflow" system.[2] Instead of moving documents from one employee workstation to another, the ERP systems offered by SAP and others allowed managers to design processes that moved information and control from one software module to another. ERP systems allowed companies to replace older software applications with new applications, and to organize the new applications into an organized business process. This worked best for processes that were well understood and common between companies. Thus, accounting, inventory, and human resource processes were all popular targets for ERP systems.

SAP, for example, offers the following modules in their financials suite: Change Vendor or Customer Master Data, Clear Open Items, Deduction Management, Payment with Advice, Clearing of Open Items at Vendor, Reporting for External Business Partners, and SEM: Benchmark Data Collection. They also offer "blueprints," which are, in essence, alternative flow diagrams showing how the financial modules might be assembled to accomplish different business processes.

Davenport supported and promoted the use of ERP packaged applications as a way to improve business processes. At the same time, August-Wilhelm Scheer, a software systems theorist, advocated the use of ERP applications for systems development, and wrote several books promoting this approach and the use of a modeling methodology that he named ARIS.

Most large companies explored the use of document workflow systems and the use of ERP systems to automate at least some business processes. The use of document workflow and ERP systems represented a very different approach to process redesign than that advocated by the BPR gurus of the early 1990s. Gurus like Hammer had advocated a total reconceptualization of complete value chains. Everything was to be reconsidered and redesigned to provide the company with the best possible new business process. The workflow and ERP approaches, on the other hand, focused on automating existing processes and replacing existing, departmentally focused legacy systems with new software modules that were designed to work together. These systems were narrowly focused and relied heavily on IT people to put them in place. They provided small-scale improvements rather than radical redesigns.

We have already considered two popular software approaches to automating business processes: workflow and the use of systems of packaged applications. Moving beyond these specific techniques, any software development effort could be a response to a business process challenge. Any company that seeks to improve a process will

[2] Systems that coordinate the flow of work from one software application to another are usually called *Enterprise Application Integration* (EAI) systems.

at least want to consider if the process can be automated. Some processes can't be automated with existing technology. Some activities require people to make decisions or to provide a human interface with customers. Over the course of the past few decades, however, a major trend has been to increase the number of tasks performed by computers. As a strong generalization, automated processes reduce labor costs and improve corporate performance.

Software engineering usually refers to efforts to make the development of software more systematic, efficient, and consistent. Increasingly, software engineers have focused on improving their own processes and on developing tools that will enable them to assist business managers to automate business processes. We mentioned the work of the Software Engineering Institute at Carnegie Mellon University on CMM, a model that describes how organizations mature in their use and management of processes.

At the same time, software engineers have developed modeling languages for modeling software applications and tools that can generate code from software models. Some software theorists have advocated developing models and tools that would allow business analysts to be more heavily involved in designing the software, but to date this approach has been limited by the very technical and precise nature of software specifications. As an alternative, a good deal of effort has been focused on refining the concept of *software requirements*—the specification that a business process team would hand to a software development team to indicate exactly what a software application would need to do to support a new process.

The more complex and important the business process change, the more likely a company will need to create tailored software to capture unique company competencies. Whenever this occurs, then languages and tools that communicate between business process teams and IT teams become very important.

The Internet and Y2K

During the same period that the enthusiasm for BPR was declining, and at the same time that companies began to explore workflow and ERP approaches, new software technologies began to emerge that really could deliver on the promise that the early BPR gurus had oversold. Among the best known are the Internet, email, and the Web, which provide powerful ways to integrate employees, suppliers, and customers.

In the early 1990s, when Hammer and Davenport wrote their books, the most popular technique for large-scale corporate systems integration was EDI (electronic

data interchange). Many large companies used EDI to link with their suppliers. In general, however, EDI was difficult to install and expensive to maintain. As a practical matter, EDI could only be used to link a company to its major suppliers. Smaller suppliers couldn't afford to install EDI and didn't have the programmers required to maintain an EDI system. The Internet changed that.

The Internet doesn't require proprietary lines, but runs instead on ordinary telephone lines. At the same time, the Internet depends on popular, open protocols that were developed by the government and were widely accepted by everyone. A small company could link to the Internet and to a distributor or supplier in exactly the same way that millions of individuals could surf the Web, by simply acquiring a PC and a modem and using browser software. Just as the Internet provided a practical solution for some of the communications problems faced by companies, email and the Web created a new way for customers to communicate with companies. In the late 1990s, customers rapidly acquired the habit of going to company Web sites to find out what products and services were available. Moreover, as fast as companies installed Web sites that would support it, customers began to buy products online. In effect, the overnight popularity of the Internet, email, and the Web in the late 1990s made it imperative that companies reconsider how they had their business processes organized in order to take advantage of the major cost savings that the use of the Internet, Web, and email could provide.

Of course the story is more complex. A number of "dot.com" companies sprang up, promising to totally change the way companies did business by using the Internet, Web, and email. Some have carved new niches for themselves, but most disappeared when the stock market finally realized that their business models were unsound. That process encouraged large, established companies to consider how they could use Internet technologies, but it also distracted them and encouraged some to attempt rash ventures to compete with the dot.coms that achieved extraordinary stock valuations in the late 1990s.

At the same time, other technology gurus began to warn of the approach of the end of the millennium. Too many software systems had been created in the last half of the 20th century with two-digit dates (e.g., instead of representing the year 1965 with four digits, it was represented as "65"). This had been done on the assumption that the systems created in that manner would be retired well before the end of the millennium. Most hadn't, and that posed a significant problem, since it was possible that a system given the date "01" would read it as "1901" rather than "2001" and make costly, and in some cases life-threatening, mistakes. Thus, in spite of the opportunity

for process improvement created by Internet techniques, many companies diverted IT resources to checking their existing software applications to assure that they didn't contain what became popularly known as the Y2K bug.

The overall result is that change that might have happened in the late 1990s was delayed, but it is now at the top of most companies' agenda in the first decade of the new millennium.

A Quick Summary

Figure 1.5 provides a summary overview of some of the historic business process technologies we have described in this chapter. Most are still actively evolving. As you can see in the figure, business process management is made up of a diverse collection of ideas and traditions. We have grouped them, very loosely, into three general traditions, the Operations Research/Quality Control tradition that is primarily focused on improving operational processes, the Management and Business Process Redesign tradition that is focused on aligning or changing major business processes to significantly improve organizational performance, and the IT tradition, which is primarily focused on process automation. Most large companies have groups working in each of these traditions, and, increasingly the different traditions are borrowing from each other. And, of course, none of the groups has confined itself to a single tradition. Thus, Lean Six Sigma is focused on process improvement, but it also supports process management and process redesign initiatives. Similarly, IT is focused on automation, but IT process groups are often heavily involved in process redesign projects and are strongly committed to architecture initiatives that incorporate process architectures.

The author of this book comes from the Management and Process Redesign tradition—he began his process work as an employee of a consulting company managed by Geary Rummler—and this book describes that tradition in more detail than any other. However, the author has worked with enough different companies to know that no solution fits every situation. Thus, he is firmly committed to a best-practices approach that seeks to combine the best from all the process change traditions and provides information on the other traditions whenever possible to encourage the evolving synthesis of the different process traditions. Senior managers do not make the fine distinctions that we illustrate in Figure 1.5. Executives are interested in results and, increasingly, effective solutions require practitioners from the different traditions to work together. Indeed, one could easily argue that the term "business process management"

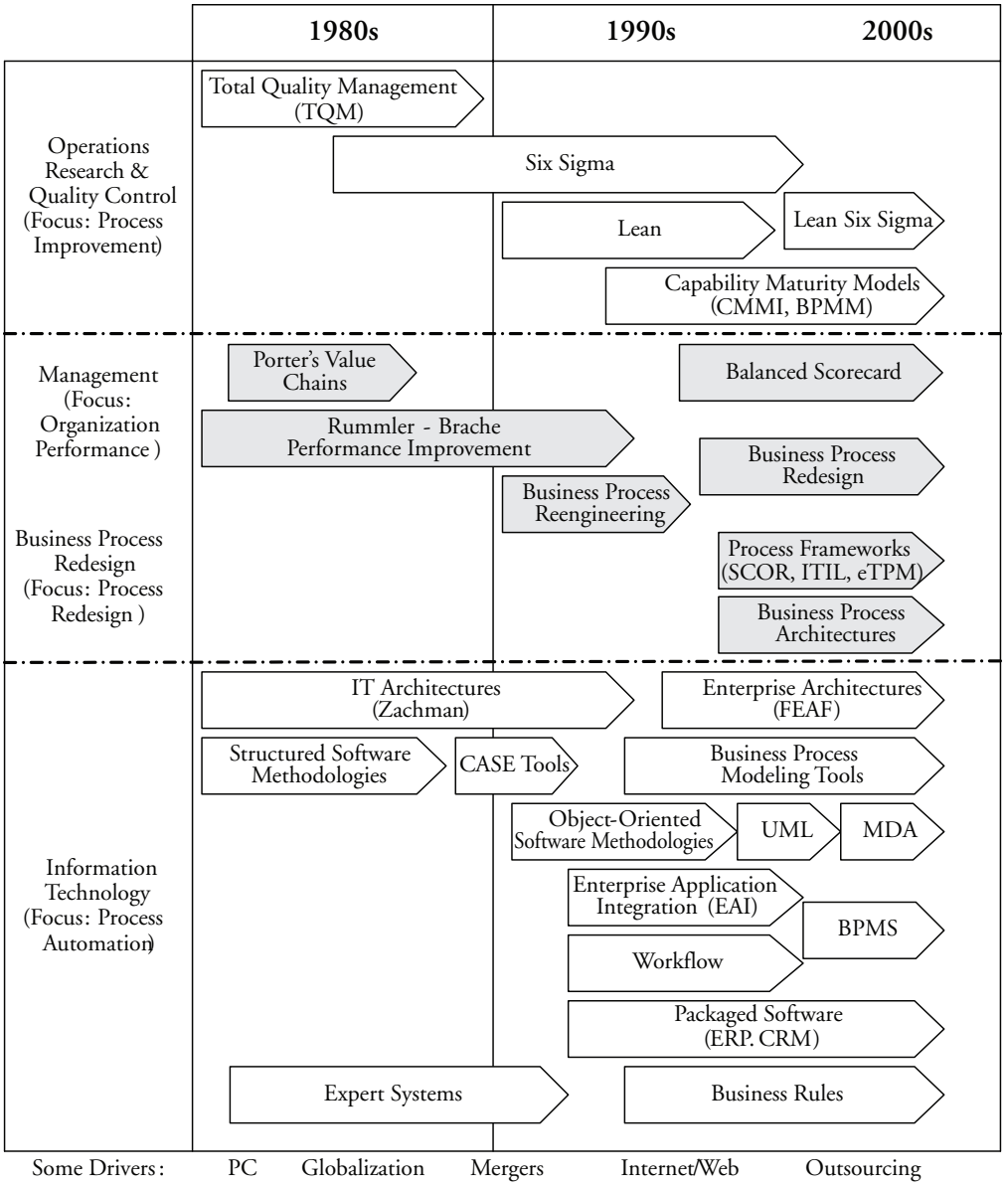

Figure 1.5 Some key ideas and groups that are part of the business process management movement.

was coined to suggest the emergence of a more synthetic, comprehensive approach to process change that combines the best of process management, redesign, process improvement and process automation.

Business Process Change in the New Millennium

For awhile, the new millennium didn't seem all that exciting. Computer systems didn't shut down as the year 2000 began. The collapse of the dot.com market and a recession seemed to provide a brief respite from the hectic business environment of the nineties. By 2002, however, the sense of relentless change had resurfaced.

The corporate interest in business process change, which seemed to die down a bit toward the end of the century, resurfaced with a vengeance. Many people working in IT realized that they could integrate a number of diverse technologies that had been developed in the late 1990s to create a powerful new approach to facilitate the day-to-day management of business processes. The book that best reflected this new approach was called *Business Process Management: The Third Wave* by Howard Smith and Peter Fingar. They proposed that companies combine workflow systems, software applications integration systems, and Internet technologies to create a new type of software application. In essence the new software—a Business Process Management System (BPMS)—would coordinate the day-to-day activities of both employees and software applications. The BPMS applications would use process models to define their functionality, and make it possible for business managers to change their processes by changing the models or rules that directed the BPMS applications. All of these ideas had been tried before, with earlier technologies, but in 2003 it all seemed to come together, and dozens of vendors rushed to create BPMS products. As the enthusiasm spread, the vision was expanded and other technologists began to suggest how BPMS applications could drive management dashboards that would let managers control processes in something close to real time.

In 2002 there were no BPM conferences in the U.S. In 2006 there were 11 major BPM meetings in the U.S., and there will be as many in 2007. In 2003 Gartner suggested that BPMS vendors earned around $500 million dollars. Gartner now projects that the market for BPMS will exceed $1 billion by 2009.

If everyone were only excited about BPMS, then we might suggest that the market was simply a software market, but that's hardly the case. All the various aspects of business process have advanced during the same period. Suddenly large companies are making major investments in the creation of business process architectures. To create these architectures, they seek to define and align their processes while simultaneously defining metrics to measure process success. Similarly, there is a broad movement toward reorganizing managers to support process goals. Balanced Scorecard has played

a major role in this. There has been a renewed interest in using maturity models to evaluate corporate progress. A number of industry groups have defined business process frameworks, like the Supply Chain Council's SCOR and the TeleManagement Forum's eTOM, and management has adopted these frameworks to speed the development of enterprise level architectures and measurement systems.

Process redesign and improvement have also enjoyed a renaissance and Six Sigma has expanded from manufacturing to every possible industry while simultaneously incorporating Lean. A dozen new process redesign methodologies and notations have been published in the past three years and over 100 books on the various aspects of process change have been published. It's hard to find a business publication that isn't talking about the importance of process change. Clearly this interest in business process change isn't driven by just BPMS or by any other specific technology. Instead, it is being driven by the deeper needs of today's business managers.

What Drives Business Process Change?

So far, we have spoken of various approaches to business process change. To wrap up this discussion, perhaps we should step back and ask what drives the business interest in business processes in the first place. The perennial answers are very straightforward. In economically bad times, when money is tight, companies seek to make their processes more efficient. In economically good times, when money is more available, companies seek to expand, to ramp up production and to enter new markets. They improve processes to offer better products and services in hopes of attracting new customers or taking customers away from competitors.

Since the 1980s, however, the interest in process has become more intense. The new interest in process is driven by change. Starting in the 1980s, large U.S. companies became more engaged in world trade. At the same time, foreign companies began to show up in the U.S. and compete with established market leaders. Thus, in the 1970s, most Americans who wanted to buy a car chose among cars sold by General Motors, Ford and Chrysler. By the mid-1980s, Americans were just as likely to consider a VW, a BMW, a Nissan, or a Honda. Suddenly, the automobile market had moved from a continental market to a world market. This development has driven constant changes in the auto market and it's not about to let up in the next few years.

Increased competition also led to mergers and acquisitions, as companies attempted to acquire the skills and technologies they needed to control their markets or enter

new ones. Every merger between rivals in the same industry created a company with two different sets of processes and someone had to figure out which processes the combined company would use going forward.

During this same period, IT technology was remaking the world. The first personal computers appeared at the beginning of the 1980s. The availability of relatively cheap desktop computers made it possible to do things in entirely different and much more productive ways. In the mid-1990s the Internet burst on the scene and business was revolutionized again. Suddenly people bought PCs for home use so they could communicate via email and shop on-line. Companies reorganized their processes to support web portals. That, in turn, suddenly increased competitive pressures as customers in one city could as easily buy items from a company in another city or country as from the store in their neighborhood. Amazon.com revolutionized the way books are bought and sold.

The Internet and the Web and the broader trend toward globalization also made it easier for companies to coordinate their efforts with other companies. Increased competition and the search for greater productivity led companies to begin exploring all kinds of outsourcing. If another company could provide all the services your company's Human Resources or IT departments used to provide, and was only an email away, it was worth considering. Suddenly companies that had historically been manufacturers were outsourcing the manufacture of their products to China and were focusing instead on sticking close to their customers, so they could specialize in designing and selling new products that would be manufactured by overseas companies and delivered by companies who specialized in the worldwide delivery of packages.

In part, new technologies like the Internet and the Web are driving these changes. They make worldwide communication easier and less expensive than in the past. At the same time, however, the changes taking place are driving companies to jump on any new technology that seems to promise them an edge over their competition. Wireless laptops, cell phones and personal digital assistants are being used by business people to work more efficiently. At the same time, the widespread purchase of iPods by teenagers is revolutionizing the music industry and driving a host of far-reaching changes and realignments.

We won't go on. Lots of authors and many popular business magazines write about these changes each month. Suffice it to say that change and competition have become relentless. Large companies are reorganizing to do business on a worldwide scale, and, predictably, some will do it better than others and expand, while those that are less

successful will disappear. Meantime, smaller companies are using the Internet and the Web to explore the thousands of niche service markets that have been created.

Change and relentless competition calls for constant innovation and for constant increases in productivity, and those both call for an intense focus on how work gets done. To focus on how the work gets done is to focus on business processes. Every manager knows that if his or her company is to succeed it will have to figure out how to do things better, faster, and cheaper than they are being done today, and that's what the focus on process is all about.

Notes and References

We provided a wide-ranging history of the evolution of business process techniques and concerns. We have included a few key books that provide a good overview to the concepts and techniques we described.

McCraw, Thomas K. (Ed.), *Creating Modern Capitalism: How Entrepreneurs, Companies, and Countries Triumphed in Three Industrial Revolutions*, Harvard University Press, 1997. A good overview of the Industrial Revolution, the rise of various early companies, the work of various entrepreneurs, and the work of management theorists like F. W. Taylor.

Taylor, Frederick W., *The Principles of Scientific Management*, Harper's, 1911. For a modern review of the efficiency movement and Taylor, check Daniel Nelson's *Frederick W. Taylor and the Rise of Scientific Management*, University of Wisconsin Press, 1980.

Bertalanffy, Ludwig von, *General Systems Theory: Foundations, Development, Applications*, George Braziller, 1968. An early book that describes how engineering principles developed to control systems ranging from thermostats to computers provided a better way to describe a wide variety of phenomena.

Beer, Stafford, *Brain of the Firm*, Harmondsworth, 1967. Early, popular book on how managers should use a systems approach.

Forrester, Jay, *Principles of Systems*, Pegasus Communications, 1971. Forrester was an influential professor at MIT who wrote a number of books showing how systems theory could be applied to industrial and social systems. Several business simulation tools are based on Forrester's ideas, which are usually referred to as *systems dynamics*, since they focus on monitoring and using changing rates of feedback to predict future activity.

Sterman, John D., *Business Dynamics: Systems Thinking and Modeling for a Complex World*, Irwin McGraw-Hill, 2000. Sterman is one of Forrester's students at MIT, and this is a popular textbook for those interested in the technical details of systems dynamics, as applied to business problems.

Senge, Peter M., *The Fifth Discipline: The Art and Practice of the Learning Organization*, Currency Doubleday, 1994. Senge is also at the Sloan School of Management at MIT, and a student of Forrester. Senge has created a more popular approach to systems dynamics that puts the emphasis on people and the use of models and feedback to facilitate organizational development. In the Introduction we described mature process organizations as organizations that totally involved people in constantly improving the process. Senge would describe such an organization as a learning organization.

Porter, Michael E., *Competitive Advantage: Creating and Sustaining Superior Performance*, The Free Press, 1985. This book focuses on the idea of competitive advantage and discusses how companies obtain and maintain it. One of the key techniques Porter stresses is an emphasis on value chains and creating integrated business processes that are difficult for competitors to duplicate.

Hammer, Michael, "Reengineering Work: Don't Automate, Obliterate," *Harvard Business Review*. July–August 1990. This article, and the one below by Davenport and Short, kicked off the BPR fad. The books that these authors are best known for didn't come until a couple of years later.

Rummler, Geary, and Alan Brache, *Performance Improvement: Managing the White Space on the Organization Chart*, Jossey-Bass, 1990. Still the best introduction to business process redesign for senior managers. Managers read Hammer and Davenport in the early 1990s, and then turned to Rummler and Brache to learn how to actually do business process redesign. So many ideas that we now associate with business process change originated with Geary Rummler. Davenport, Thomas H., and James Short, "The New Industrial Engineering: Information Technology and Business Process Redesign," *Sloan Management Review*, Summer 1990.

Hammer, Michael, and James Champy, *Reengineering the Corporation: A Manifesto for Business Revolution*, HarperBusiness, 1993. This was a runaway bestseller that got everyone in business talking about reengineering in the mid-1990s. It argued for a radical approach to redesign. Some companies used the ideas successfully; most found it too disruptive.

Davenport, Thomas H., *Process Innovation: Reengineering Work through Information Technology*, Harvard Business School Press, 1993. This book doesn't have the breathless marketing pizzazz that Hammer's book has, but it's more thoughtful. Overall, however, both books advocate radical change to take advantage of the latest IT technologies.

Smith, Adam, *The Wealth of Nations*, (any of several editions). Classic economics text that advocates, among other things, the use of work specialization to increase productivity.

Fischer, Layna (Ed.), *The Workflow Paradigm: The Impact of Information Technology on Business Process Reengineering* (2nd ed.), Future Strategies, 1995. A good overview of the early use of workflow systems to support BPR efforts.

Davenport, Thomas H., *Mission Critical: Realizing the Promise of Enterprise Systems,* Harvard Business School Press, 2000. This is the book in which Davenport laid out the case for using ERP systems to improve company processes.

Ramias, Alan. *The Mists of Six Sigma*, www.bptrends.com, Oct. 2005. Excellent history of the early development of Six Sigma at Motorola.

Scheer, August-Wilhelm, *Business Process Engineering: Reference Models for Industrial Enterprises* (2nd ed.), Springer, 1994. Scheer has written several books, all very technical, that describe how to use IT systems and modeling techniques to support business processes.

Harry, Mikel J., and Richard Schroeder, *Six Sigma: The Breakthrough Management Strategy Revolutionizing the World's Top Corporations*, Doubleday and Company, 1999. An introduction to Six Sigma by the Motorola engineer who is usually credited with originating the Six Sigma approach.

Harrington, H. James, Erik K.C. Esseling and Harm Van Nimwegen, *Business Process Improvement Workbook,* McGraw-Hill, 1997. A very practical introduction to process improvement, very much in the Six Sigma tradition, but without the statistics and with a dash of software diagrams.

Boar, Bernard H., *Practical Steps for Aligning Information Technology with Business Strategies: How to Achieve a Competitive Advantage*, Wiley, 1994. Lots of books have been written on business-IT alignment. This one is a little out of date, but still very good. Ignore the methodology, which gets too technical, but focus on the overviews of IT and how they support business change.

CIO, "Reengineering Redux," *CIO Magazine*, March 1, 2000, pp. 143–156. A roundtable discussion between Michael Hammer and four other business executives on the state of reengineering today. They agree on the continuing importance of process change. For more on Michael Hammer's current work, check his Web site: *www.hammerandco.com.*

Smith, Howard and Peter Fingar*, Business Process Management, The Third Wave,* Meghan-Kiffer Press, 2003. Although this book is a bit over the top in some of its claims, like Hammer and Champy's *Reengineering the Corporation*, it got people excited about the idea of Business Process Management Software systems and helped kick off the current interest in BPM.