THE SECOND PHASE of the BPTrends enterprise methodology focuses on creating a business process architecture for the organization. As we have already suggested, we create a separate enterprise architecture for each value chain, so, in effect, we are really talking about creating a business process architecture for a value chain.

Figure 4.1 BPTrends enterprise methodology.
Different authors and different companies use the term *business process architecture* in diverse ways. In this book, we will use this term to refer to a body of knowledge about the business processes that comprise a value chain. The knowledge is organized by a hierarchical decomposition of the processes that make up the value chain. The processes, in turn, organize information about the performance measures, process managers and organizational resources used by the various processes. The entire business process architecture is hierarchically organized so that executives can see how specific processes are aligned to support the organization's strategic goals, how process measures are aligned and what resources are required for what processes and vice versa.

**Process Hierarchies**

A value chain is the largest process we normally talk about. It defines a process that begins when the company decides to create a new product or service, or when a customer orders a product, and concludes when the customer has and is satisfied with the product or service. Today, some companies talk about value chains that extend across several companies, but that kind of multicompany process is still relatively rare. The value chain is usually termed the Level 0 process. The major operational processes within a value chain are usually processes like Design New Products, Sell Products to Customers, and Create and Deliver Products to Customers (i.e., Supply Chain). Any one of these Level 1 processes can be subdivided into several Level 2 processes. Thus, the Supply Chain Council's SCOR framework divides the Level 2 operational Supply Chain process into: Source, Make, Deliver and Return.

The use of terms like superprocess and subprocess depends upon where you start. From any arbitrary process, the larger process that contains it is its superprocess. Similarly, the processes contained in the arbitrary process are termed its subprocesses.

There is no technical limit to the subdivision of processes. It's common to see processes divided into three or four levels. It is rare to see a process divided into more than seven or eight levels. For our purposes, the smallest process we diagram is called an activity. We do this simply because process standards like UML and BPMN arbitrarily define a process as made up of activities. That said, it is common to have subdivisions that don't get diagrammed and are defined by outlines or other textual definitions. Thus, we use the terms *steps, tasks* and *procedures* either loosely, or to describe the subelements of an activity.
Other authors define these terms in alternate ways and there is, of course, no definitive way of naming process levels. The important thing is simply to keep in mind that processes can be hierarchically arranged and that you need to know, when you consider a project, whether you are going to be analyzing a relatively large process, like a supply chain; a midsized process, like applying for a loan or returning an item; or a small process, like obtaining a credit card approval, or checking a loan application for completeness.
Defining a Business Process Architecture

A business process architecture can be created on paper. To illustrate the basic concepts and relationships, we will use worksheets to explain the process. Any large company, however, will want to use software tools to create and maintain their business process architecture. The relationships involved and the amount of data involved quickly become so complex and extensive that a database is required to manage the architecture.

The key steps involved in creating a business process architecture are as follows:

- Identify a specific value chain.
- Determine the specific strategic goals the value chain is to achieve.
- Determine how you will measure whether or not the value chain achieves its goals.
- Subdivide the value chain into its major processes (Level 1 processes). Subdivide the major processes (Level 1 processes) into their subprocesses (Level 2 processes). If appropriate, subdivide the Level 2 processes into their subprocesses (Level 3 processes).
- Use a worksheet. For each Level 1 process, determine how the Level 1 process will be measured. Determine who will be responsible for the process. Determine what resources are linked to each Level 1 process.
- Repeat this procedure, using new worksheets, for each Level 2 process, and so forth.

Figure 4.3 illustrates the top half of an architecture analysis worksheet and indicates the information that should be included.

<table>
<thead>
<tr>
<th>Strategy Analysis Worksheet – Level 1 Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Chain: Value Chain Process Manager</td>
</tr>
<tr>
<td>Strategic Goals for Value Chain:</td>
</tr>
<tr>
<td>Level 1 Processes</td>
</tr>
</tbody>
</table>

Figure 4.3 A Level 1 architecture analysis worksheet.

In Chapter 3 we ended up describing a value chain in terms of three major subprocesses, as pictured in Figure 4.4.
Once we begin to try to analyze a large number of processes and subprocesses, it is often easier to switch to a horizontal process decomposition diagram like the one shown in Figure 4.5. In this case we have broken a Widget Value Chain into three core
processes, then subdivided each of those into subprocesses and subdivided one of the Level 2 processes into a further set of subprocesses.

There are different ways of developing a comprehensive decomposition of a value chain. One can begin with a room full of senior executives and a white board and simply ask: “OK, how do you produce widgets? Where do you begin? What happens next?” This is the traditional approach and, although it’s time consuming, it’s effective, and it often surfaces lots of concerns about how specific things are done. In many cases, executives do not realize, before they sit down and try to describe it, just how confusing and redundant some of their processes really are. Often, each has only focused on one or another portion of the process and never tried to create a diagram that showed how it all fit together into a value chain.

Increasingly today, managers are approaching the analysis of process architectures in a different way. They are using process frameworks—generic models of all the processes in a value chain, or in a part of a value chain—to provide them with a complete description. Starting with a framework, the executives tailor it to provide a description of their particular value chain. The process framework-based approach works because, at level 1 and 2, most companies do things in a very similar manner, even though they use very different words to describe their processes. Thus, whatever you call them, everyone has some kind of new product/service development process, some kind of product/service development process with an associated procurement process, and some kind of marketing and sales process. We’ll look at process frameworks in more detail in a moment; meantime, if you look again at the horizontal value chain decomposition diagram pictured in Figure 4.5, you can see how we move from a process description to worksheets. Worksheet 1 provides space to describe the attributes and resources that support the Level 1 processes in a value chain. The various Level 2 Worksheets allow the analysts to drill down into each specific Level 1 process to identify the attributes and resources used by the Level 2 processes.
Completing a Worksheet

Working across the Level 1 worksheet shown in Figure 4.3, you can see that the top of the worksheet provides a space for the name of the value chain and for a description of how that value chain supports the corporate strategy and how it will be measured. In some cases this discussion will be brief. In other cases the discussion will take time and involve senior managers in very serious discussions of exactly what the supply chain should aim to achieve. Some might see the value chain contributing to the profit of the company. Others might feel that the specific value chain was being undertaken to support the image of the company or to generate ideas for future business ventures. The goals of the value chain must be concisely defined and measures must be developed that everyone agrees will accurately reflect the success or failure of the value chain.

Next, the architecture group should define the Level 1 processes that comprise the value chain. The trick is to keep them simple and general and to limit them to about three to seven processes. Most generic frameworks focus on three level 1 processes—a design process, a product/service development/delivery process, and a sales/marketing/service process.
Core, Support and Management Processes

So far, we have focused on core or operational processes. These are processes that add value to the product or service that the organization is producing for its customers. When Michael Porter defined the value chain, he distinguished between core and support processes. Core processes generate products or services. Support processes do not add value, but are necessary to assure that the core processes continue to function. Thus, in a manufacturing organization, accounting is a support process. We maintain the books to let management know how much manufacturing is costing and to enable them to report to stockholders. Similarly, IT is a support process that generates and maintains the software and systems that manufacturing needs to control its production-line machinery. Today, it is popular to divide support processes between processes that directly support the core processes and more generic management processes that plan, organize, communicate, monitor and control the activities of the organization. Support processes are sometimes called enabling processes.

Figure 4.7 provides one way of thinking about the distinction. In this case, we have a core set of processes that generates a product. Separately, we have a support process—the Stock Reorder Process—that resupplies a core assembly process. We also

![Figure 4.7 Three types of processes: Core, Management and Support processes.](image-url)
have a management process that determines which suppliers the company will use and establishes and maintains relationships with the suppliers. Obviously, this management process could be an activity undertaken by procurement, but it might also be a process undertaken by finance.

Should we include support or enabling processes in our business process architecture, and, if so, how should we represent them? One approach would be to divide all support processes and organize the support processes under the core processes they enable. This is conceptually clean, but it isn't, in fact, very realistic. In most cases, a company conceptualizes its IT group as a department. In the best case the IT group is managed as a matrix organization, and has some managers responsible for generic IT functions like new product development and ongoing software maintenance, and other managers responsible for IT support for the Supply Chain and IT support for Sales and Marketing. The key here, however, is that IT has a core set of functions, like the company network and good maintenance practices, that apply to all processes or departments it supports; thus, there is a very strong argument for treating IT as an independent department.

An alternative approach, which is increasingly popular, is to treat IT as an independent organization, a cost center, or an independent value chain. This reflects what happens when IT is outsourced. In essence, IT becomes a separate company—a value chain that produces software and services that it sells to the parent company's core processes. Whether your company outsources IT or keeps it in house, if you regard it as its own value chain, and create an independent business process architecture to describe IT's core, support and management processes, you will find that it makes everything easier to understand. Obviously, the same logic can be applied to the other main support processes, including human resources, facilities, and accounting. If you follow this approach, then you will leave support processes off the business process architecture worksheets you create for your core value chains and describe each major support process as an independent architecture with its own worksheets.

Handling management processes is trickier, because the whole idea of management processes has not been very well thought out. To begin with, we need to discriminate between two basic types of "management processes." In one case, we have the processes or activities that are performed by the individuals that actually manage processes on a day-to-day basis. Thus, if we consider Figure 4.7, there is some individual who is responsible for managing the Fill Order From Stock process. That individual plans, organizes, communicates, monitors and controls the Fill Order From Stock
process each hour of each day. He or she interacts with the employees that undertake
the tasks that we associate with the Fill Order From Stock process, communicates
new targets as they occur, and provides feedback when employees do their work in an
outstanding or an unacceptable manner. It isn't useful to treat the day-to-day process
management directly associated with the core process as a separate process. When you
seek to redesign or improve the process, you need to consider both the activities of the
employees assigned to the process and, simultaneously, the activities of the manager
who is in charge of the process. Insofar as it's useful to discriminate these day-to-day
process management processes, it's done to define standard or best-practice procedures
that process managers should follow. We'll consider standard process management
practices later, when we consider process management and the establishment of BPM
support groups. At this point, however, we will simply ignore these day-to-day man-
agement processes. They are so closely associated with core processes that they don't
need an independent representation on our business process architecture.

There remain some general management processes that perform enterprise plan-
ning, organizing, communication or monitoring functions. In essence, if the organiza-
tion has a business rules group that works to define company policies and to dictate the
business rules that specific processes should implement, that group and the processes it
implements constitute a kind of management process. Similarly, the team that defines
corporate strategy follows a process and the BPM group implements a set of processes.
These are true management processes that are independent of the core processes in a
normal value chain. Sophisticated companies will want to analyze these management
processes to assure that they function as efficiently and effectively as possible. Thus,
we should define them and document how they function. The question is where to
include them. Unlike the standard support processes, like IT and HR, it is hard to
think of these “management processes” as a cost center or an independent company.
It's easier to simply think of them as activities undertaken by senior managers. At the
moment, it is probably best to simply think of all the “management processes” that are
independent of specific operational processes as their own “management value chain”
and document them on their own worksheets. It's not a very elegant solution, but it's
probably better than trying to associate them with a conventional value chain.
Aligning Managers, Measures and Resources

As processes are identified, the group can determine who is responsible for managing that process. If the company is functionally oriented, then at the highest level it will often be the case that there is no clear manager for Level 1 processes. Instead, the processes will be divided among multiple departments, with no one responsible for overall coordination. We are going to skip any further discussion of process management at this point and delay it until we reach Chapter 5. Suffice it to say that if the team has trouble assigning managers to processes, that should stimulate a discussion of how processes are managed in the organization.

Next, the team should define the goal of each Level 1 process and consider how the success of each of the Level 1 processes should be measured. As with management, we’ll delay a discussion of measurement until we reach the next chapter.

The final column on the worksheet asks the architecture team to list resources that are required to support each Level 1 process. This emphasizes that the development of a business process architecture is a long-term undertaking. Obviously, the architecture team could not identify the jobs or the software systems associated with each Level 1 process in the course of a day or a week. In fact, most organizations skip resource alignment during the first pass, and leave it till the entire architecture is better understood. As time passes, the organization and those concerned with processes will find that it would be useful to determine how different resources are aligned, and they will then proceed to capture information about the alignment of those resources. Many organizations create an architecture, and then add detailed resource information to it as the organization undertakes business process change projects. In this case, no one sets out to list every ERP application that every process uses, but as processes are redesigned, information about ERP support is captured and added to the architecture database.

Some of the types of resources that organizations might seek to align with Level 1 or Level 2 processes include:

- **Alignment with corporate strategies and goals.** Some organizations list information about specific Level 1 strategies and stakeholders and note how the specific strategies support corporate strategies. Others list all the stakeholders that are interested in each specific Level 1 process.

- **Alignment with other processes.** So far we have emphasized core or operational processes. Once the operational processes are defined, some companies proceed
to describe management and support processes and indicate just which core or operational processes depend on which management or support processes. We'll consider this in more detail in the next chapter when we discuss management. Many companies are interested in identifying specific subprocesses or activities that are repeated in different Level 1 or 2 processes. Assume, for example, that a Level 1 process includes a Level 3 or 4 subprocess that is called: Determine Customer Credit. Imagine, further, that the determination of customer credit occurred in several Level 1 and 2 processes, and that in some cases it was done by employees and in other cases it was done using an ERP module. It would be nice to know everywhere customer credit was determined, so that the activity could be standardized and the same software could be used whenever possible. Thus, simply listing subprocesses and activities that occur in multiple Level 1 processes can be very useful.

- **Alignment with policies and rules.** Many organizations list the corporate policies that apply to specific Level 1 or 2 processes. As the analysis becomes more comprehensive, organizations may list the specific business rules that are used in specific subprocesses, and then check to see that policies and rules are being consistently applied.

- **Alignment with IT resources.** Lots of organizations indicate which software applications or which databases are used by which processes. If the effort to correlate IT resources with specific business processes becomes very elaborate, it is often termed an enterprise architecture. If a company uses ERP applications, the process architecture is often driven or supported by process architectures suggested by ERP vendors.

- **Alignment with HR resources.** Many organizations define which roles or jobs are associated with which Level 2 or 3 processes. If this is carried further, job descriptions associated with processes may be defined, or job competencies may be defined. Similarly, some organizations list the employee documents and the training programs that are given in support of each specific process.

- **Alignment with Sarbanes-Oxley, ISO 9000 and various risk management standards.** Organizations are increasingly responsible for gathering and maintaining information about the decisions and the risks involved in specific processes. This information can naturally be placed in the business process architecture database. As time passes and more information is gathered, organizations with comprehensive business process architectures find themselves reversing the process and using the architecture database to generate information required by external agencies.
A business process architecture is a management tool. Once it is defined and then populated with up-to-date data, it can be used, like other databases, to answer ad hoc questions that executives need answered. It can be used to support those engaged in developing corporate strategies and it can be used by a BPM group to identify processes that aren't meeting their goals and that need to be redesigned. The information placed in the business process architecture database will depend on how the company uses it. Most companies that have created architectures find that they make it easier for managers to conceptualize their organizations in terms of processes, which leads to requests for more and more information about the processes that company supports.

Defining a Business Process Architecture

One creates a business process architecture by decomposing a value chain into processes and subprocesses. As we noted earlier, increasingly high-level process analysis efforts are being supported by the use of process frameworks. At this point, we want to look at process frameworks in a little more detail.

The Supply Chain Council’s SCOR Framework

The Supply Chain Council (SCC) was established as a nonprofit consortium in 1996. Today, it is a worldwide organization with over 700 members. The Council conducts meetings that allow companies to gather together to discuss supply chain problems and opportunities. In addition, it has been working on a standard supply chain framework or reference model, SCOR.

Before considering SCOR itself, let's consider why the SCC membership was motivated to develop the framework in the first place. Increasingly, companies are creating supply chain systems that cross company boundaries. Thus, it is not uncommon for ten or twenty companies to sit down to figure out how their companies will work together to move materials to manufacturers and then to distributors and, ultimately, to customers. If each team had to begin by trying to straighten out what terms they used to describe what processes, the effort would take a lot more time. Instead, the Supply Chain Council decided to define a high-level set of supply chain process names that everyone could use. Each company could continue to use whatever particular process names they chose, but in conversations with the other companies, each could use the standard vocabulary defined by SCOR. Later, the SCOR model was extended
so that it not only defines core processes, but also defines management and support processes and provides precisely defined performance measures for each process. Using the performance information, companies can define who will pass what to whom and when, in an unambiguous manner. Having once established the system, the SCC members then proceeded to provide performance information to an external benchmarking organization that provides general information in return. Thus, an individual company can determine how its delivery processes compare with other members of the SCC, or, more specifically, with others in the same industry. Thus, SCOR began as an effort to facilitate efficient communication and modeling and evolved into a general methodology that can be used to quickly define a supply chain architecture complete with benchmarked measures.

Let's begin with a more detailed look at the SCOR architecture. The SCC speaks of SCOR as being comprised of three levels. They ignore the fact that the supply chain is only one of the major business processes that make up the entire value chain. To clarify this, we will always refer to the value chain as Level 0. Then we will refer to the supply chain as a Level 1 process. To make things even more complex, SCOR subdivides the supply chain into three “levels” but, in fact, one of the levels is not a decomposition of the higher level, but instead requires the modeler to define the higher-level process in terms of one of three variations. Either the Level 1 source process is concerned with Stocked Products or it is concerned with Made-to-Order products, or with Engineered-to-Order products. To simplify things, we will consistently speak of SCOR as having three levels. Level 1 is the supply chain. Level 2 consists of the high-level processes that make up a supply chain, including Source, Make, Deliver and Return. Plan is an additional SCOR process that describes management planning. These Level 2 processes are first defined. Then their variation is specified, and then they are decomposed into a set of Level 3 subprocesses, as pictured in Figure 4.8.

The SCOR reference manual defines each Level 2 and Level 3 subprocess and also indicates what planning and support processes are typically linked to each process or subprocess. The SCC does not define a fourth level, leaving the specification of Level 4 activities to individual companies. In other words, SCOR defines a supply chain architecture and all of the high-level processes and leaves the technical implementation of the Level 4 processes to the individual members.
Developing a Supply Chain Architecture with SCOR

Using SCOR, a company can quickly characterize its supply chain architecture. Figure 4.9 illustrates a map that SCOR architects usually draw to show where materials originate and how they are moved to assembly points and then distributed to customers.

Once the supply chain is described by means of a map, it is then redrawn using the SCOR diagramming convention illustrated in Figure 4.10. The SCC refers to the diagram as a thread diagram. In this diagram, each Level 2 process in the supply chain is illustrated with a small arrowhead. The bold lines separate companies and the dashed line separates divisions within a company. Notice that two suppliers are feeding the Alpha company supply chain. The letters indicate that a process is either a Source (S) process, a Make (M) process, or a Deliver (D) process. The numbers indicate the variation. Thus, an S1 is a Source process that relies on continuously Stocked products, while an M2 process is a Make process that relies on providing products that...
are Made-to-Order. (Refer to Figure 4.6 for the designations.) A thread diagram can be quite a bit more complex if the supply chain involves multiple columns of suppliers and columns of distributors. Similarly, in more complete diagrams, the Plan processes are also entered. In effect, as Plan refers to a process management effort. For every core process shown on the thread diagram, there is also a Plan process.
The Supply Chain Council provides members with a reference manual that defines every supply chain process and subprocess. In addition, the manual describes performance measures that are appropriate to each process at each level. The SCC divides all performance measures into five general categories, which are then clustered into either external or customer facing metrics or internal facing metrics. Figure 4.11 provides a high-level overview of the measures that are defined for the supply chain as a whole (the Level 1 process). We won’t go into measures any further here, but suffice it to say that one can use the SCOR metrics to quickly generate an interlocking list of metrics for an entire supply chain architecture.

![Figure 4.11 SCOR performance attributes and Level 1 metrics.](image)

Several organizations that track benchmarks are working with the Supply Chain Council and can provide generic benchmarks for SCOR measures for specific industries. If a company wants specific benchmark data, it needs to contract with one of the benchmarking groups.
In Figure 4.12, we illustrate what SCOR refers to as a SCORcard. It shows the performance attributes, a set of historical data, and the benchmark data for a hypothetical company's supply chain. In the right-hand column, the team has made some "guestimates" about what kind of value Alpha might achieve, assuming it could move its supply chain process closer to the average for its industry. SCOR terms the comparison of the company's actual, historical performance with the benchmarks for the company's industry as a gap analysis, and uses it to determine if redesign or improvements in the As-Is supply chain will really justify an investment.

<table>
<thead>
<tr>
<th>Supply Chain SCORcard</th>
<th>Performance Versus Competitive Population</th>
<th>Value from Improvements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview Metrics</td>
<td>SCOR Level 1 Metrics</td>
<td>Actual</td>
</tr>
<tr>
<td>Supply Chain Reliability</td>
<td>Delivery Performance to Commit Date</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Fill Rates</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td>Perfect Order Fulfillment</td>
<td>0%</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>Order Fulfillment Lead times</td>
<td>35 days</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Supply Chain Response Time</td>
<td>97 days</td>
</tr>
<tr>
<td></td>
<td>Production Flexibility</td>
<td>45 days</td>
</tr>
<tr>
<td>Cost</td>
<td>Total SCM Management Cost</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>Warranty Cost</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Value Added Employee Productivity</td>
<td>NA</td>
</tr>
<tr>
<td>Assets</td>
<td>Inventory Days of Supply</td>
<td>119 days</td>
</tr>
<tr>
<td></td>
<td>Cash-to-Cash Cycle Time</td>
<td>196 days</td>
</tr>
<tr>
<td></td>
<td>Net Asset Turns (Working Capital)</td>
<td>2.2 turns</td>
</tr>
</tbody>
</table>

Figure 4.12 A SCORcard with actual and benchmark data, and some guesses about the value that might be achieved by redesigning the supply chain being analyzed.

Once the SCOR team has examined the Level 1, and in some cases the Level 2, As-Is historical data, it is in a position to decide if the supply chain should be changed. In effect, it is now ready to review the organization's existing approach to its supply chain and, if necessary, define a new supply chain strategy and to set targets, priorities and a budget for any redesign effort. The use of the SCORcard provides a nice illustration of the power of the architecture approach. Once a company has a complete overview of all its processes and solid performance data, it is positioned to consider how each of the processes are performing, compare them with benchmarks and then
decide which possible intervention would produce the most significant result. This illustrates the sense in which an architecture is a tool for management.

The Extension of SCOR

The next part of the SCOR story is closely associated with Joseph Francis and the Hewlett-Packard-Compaq merger. The HP-Compaq merger was announced in September of 2001. The previous two years had witnessed a major slump in sales, which had forced many IT companies to reevaluate their strategies. The proposed merger of two leading IT companies—the largest IT merger to date—represented a major strategic initiative on the part of the management teams at both companies to change the overall dynamics of the IT market.

HP was a leading player in mid-range servers, in PCs and laptops, and in printers. It was also a leader in integration services and outsourcing and had a worldwide reputation for cutting-edge technology. At the same time, however, HP wasn't large enough to compete for the largest service contracts, which typically went to larger competitors like IBM. Moreover, HP's marketing prowess had declined in recent years. In 2001, for example, HP had some 6,000 people in marketing, while similar-size competitors managed with one-third as many. Compaq was even stronger than HP in PC and laptop sales, but lacked HP's strength in all other areas. Compaq had acquired Tandem Computers and Digital Equipment in the late 1990s in an effort to diversify, but had never managed to utilize Tandem or Digital's strengths in mid-range computers, technology, or consulting to achieve the market presence it had hoped to obtain when it made those acquisitions. On the other hand, Compaq was known for its aggressive marketing capabilities.

The merger of the two companies would result in a significantly larger company. Together, HP and Compaq would be in a position to dominate the market for PC, laptop, server, and printer sales. At the same time, the combined company would be nearly as large as IBM and would thus be well positioned to compete on an equal footing for the largest service and outsourcing contracts. The new company would also be in the position to require suppliers to offer it the largest possible discounts. Moreover, since there was considerable overlap in the PC area, the two companies hoped to squeeze out some $2.5 billion in annual savings while simultaneously creating a leaner, more aggressive organization.
From the beginning, the proposed merger was controversial. The arguments about the wisdom of the merger and the proxy fight that followed have been extensively reported on in the popular press. Ultimately, in fact, the actual merger went smoother than most anticipated and resulted in greater savings than those who planned the merger had hoped for. As even the merger's strongest opponents admitted, the planning that preceded the merger was excellent.

What is of interest to us is the planning process that helped make the merger successful. Specifically, we want to consider the activities of the merger planning team that planned for the integration of the HP-Compaq supply chain processes. As soon as the merger was formally announced, a new organization was set up to plan for the merger. This merger organization ultimately included some 1,000 employees drawn from the two companies. The employees met in what was referred to as a clean-room environment. In effect, they were separated from the day-to-day work of both HP and Compaq, placed in an isolated setting, provided detailed information about both companies, and asked to develop a merger plan.

The merger organization was headed by an executive committee that made high-level strategic decisions and, ultimately, approved all the detailed recommendations of the more specialized teams. Reporting to the executive committee were eight teams that focused on specific areas of concern. There were teams for IT Infrastructure, Supply Chain, Sales/Orders, Product Design, Communications/Marketing, Finance, Human Resources, and Services/Support.

Some of the teams lacked any overarching framework and had to create a new, common vocabulary and a standard way of identifying existing processes. Luckily, HP and Compaq managers who were members of the Supply Chain team were familiar with the work of the Supply Chain Council (SCC). The HP-Compaq Supply Chain team realized that they could use SCOR to greatly simplify their task. SCOR provided a standard approach that they could use to rapidly characterize and measure the supply chain processes at both HP and Compaq.

By agreeing in advance to map both companies' processes to the SCOR model and to use SCOR's standard vocabulary and measures, the HP-Compaq team was able to accomplish in a month what might otherwise have taken many months.

SCOR's ease of use was critical for the work undertaken by the Supply Chain IT team during the merger. SCOR made it possible for the team to quickly analyze all of the HP and Compaq supply chains for all regions and product lines. This analysis, in turn, made it possible for the Supply Chain IT team to accurately compare a Compaq
process with an HP process for similar product lines, to determine what each process actually accomplished.

The HP-Compaq Supply Chain group was able to define all their supply chains quickly, by simply relying on SCOR’s Level 1 definitions. In effect, all supply chains were quickly divided into Sourcing processes, Make processes and Deliver processes, as well as some additional planning and enabling processes. Once this was done, high-level software applications that supported each of these processes were identified.

SCOR provides a well-defined set of measures for each of the Level 1 processes. Those measures are tied to established financial measures that both companies have tracked for years. Thus, in most cases, one simply used the SCOR Level 1 measures to compare two regional lines to determine which line was the more efficient and cost effective. If one line was clearly more efficient than the other, then the Supply Chain IT group tended to simply select the applications that supported the more efficient process.

Those familiar with how technical people can disagree about the virtues of competing software applications can easily imagine that the Supply Chain IT group could have become an arena for intense arguments among the HP and Compaq advocates of alternative software applications. The Supply Chain IT team knew that if they allowed the discussion to become focused on specific technical features they would never accomplish their assignment. Moreover, a technical discussion wouldn’t assure that the application chosen would be aligned with corporate goals. Instead, the group knew that it was important that their work focus on the value that the various applications delivered to the company. In effect, the group decided to select those applications that supported the most efficient processes, without regard to which company currently supported the application, or which departments were involved.

Some of the measures focus on external results and some focus on internal efficiencies. In each case the SCC has defined precise definitions for the measures. No organization would want to apply all of these measures to a given SCOR process or subprocess. Instead, the SCC has a methodology that helps practitioners align the measures they consider with the strategic goals the company is trying to achieve with a given supply chain process. Consider the goal of a given product line. If the company wanted to compete in the market for that product line as the low-cost provider, it would focus on keeping a minimal amount of inventory, since low inventory is one of the ways to keep costs down. On the other hand, if the company was committed to service and wanted to assure that customers could always get what they wanted,
it would need to accept higher inventory costs and would focus, instead, on satisfying customer requests. Different strategies require different measures. The Supply Chain business group made most of the decisions about marketing strategies for the combined product lines and the Supply Chain IT group then selected appropriate measures and used them to compare how the existing HP and Compaq product lines performed.

In a few cases, two competing regional lines would appear to be equally efficient and effective when analyzed with Level 1 measures. In those cases, the Supply Chain IT team would expand their effort and model the processes to SCOR Level 2 or even, in a very few cases, to Level 3.

About 20% of the total time used by the Supply Chain team was used in modeling processes, measuring them, applying criteria, and making judgments as to which applications to save and which to discard.

Once the Supply Chain group had identified product lines to maintain, modeling the processes, and then evaluated and selected applications to maintain, it was possible to step back from the specific supply chain processes being evaluated and to identify a generic supply chain architecture for the combined company. In effect, this architecture identified common supply processes, derived from SCOR, and common applications that the merged company could eventually standardize on, worldwide. The applications identified were not new applications that the merged company would acquire, but applications already being used with successful product lines that the company would standardize on and migrate to in order to minimize the number of applications the new HP would need to support.

At the end of this phase, the Supply Chain IT group had identified all of the product lines that were to be supported in the merged company, had identified all of the applications that were to be maintained and those to be dropped, and identified a set of overall architectural standards that the company would move toward as soon as possible.

Other HP-Compaq teams made their recommendations, but the Supply Chain team's recommendations stood out because they were based on an analysis of the processes involved and hard numbers on the performance of the processes. The Supply Chain team's recommendations to use specific software applications were justified by the performance of the processes that had used those applications. The business logic behind the Supply Chain team's work led to the appointment of the team's leader, Joe Francis, to the head of the new HP's business process improvement program.
The Extension of SCOR at HP

Joe Francis was impressed with how the SCOR framework had facilitated their analysis of existing supply chain processes. Since his new job required that he look at other processes in HP, he assembled a team and began to develop frameworks, like SCOR, for marketing, sales, new product development, and for various support processes. In 2003, partly because of the work he had done during the HP-Compaq merger, Joe Francis was elected chair of the SCC’s board of directors.

By 2003 HP had developed several frameworks. Unlike the SCOR framework, however, these new frameworks had only been developed by HP personnel and there were no benchmarks available to use with them. To remedy this, Joe Francis persuaded HP to offer the frameworks they had developed to the SCC to encourage the SCC to expand beyond its focus on the supply chain and eventually offer an entire value chain framework. Today, the SCC is moving beyond SCOR and has created initial standards for a DCOR (design chain) model and a CCOR (customer chain) model. Thus, in the course of the next few years, as SCC members use these new frameworks and report their results, benchmarks should become available for all of the core processes of a typical supply chain. This, in turn, means that it will be possible for a company to rapidly characterize an entire architecture using standard, benchmarked processes.

Other Approaches

Around the same time that the SCC decided to launch its extension of SCOR, a separate group of former SCC members created a new group to extend SCOR into a complete value chain framework. This group, the Value-Chain Council (VCC), has created its own model, the Value Reference Model (VRM)\(^1\), which is similar to SCOR but in some ways better integrated. Obviously, with SCOR so well established, the SCC’s effort has focused on adding new processes while leaving the existing SCOR model untouched. The Value-Chain Council was able to start from scratch and made some changes in SCOR to simplify the overall framework. Figure 4.13 illustrates the VRM approach.

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\(^1\) The VCC’s Value Reference Model was originally called VCOR, but the name was changed in early 2007 to VRM.
Notice that the VRM model does not discriminate the supply chain as a process—we’ve shown where it could be inserted between VRM levels 1 and 2—but simply treats SCOR’s four Level 2 processes Source (Buy), Make, Deliver (Fulfill) and Return (Support), as four of eight core processes. At the top level, VRM discriminates between Planning processes (we’d call them Management processes), Execution processes (we’d call them Core processes) and Manage processes (which we’d call support processes). The details of the evolving VRM model aren’t too important. What is important is that VCC is working on a complete value chain framework. Just as SCOR has processes and measures, VRM includes both a process framework and a performance measurement schema.

Figure 4.14 suggests how Plan and Manage processes support the basic Execute process.

The SCC has 700 members, an established annual budget, and a lot of momentum. On the other hand, their membership has historically been composed of supply chain managers and many of those members have resisted the SCC’s efforts to expand into other process areas. The VCC is new and has only a few members. It has the advantage of starting from scratch and taking advantage of everything the SCC has learned, but it has the challenge of recruiting members and then building a database of reliable benchmarks. At the moment, the two organizations are competing and each
stimulating the other's efforts. With luck, in a few years a merger will take place and result in a value chain framework that combines the best of the two approaches.

The TeleManagement Forum’s eTOM Framework

Another approach to a complete value chain framework is provided by the TeleManagement Forum, a consortium of telecom companies. Their framework is highly tailored to the needs of telecom companies. Thus, it can't be used by non-telecoms, but it does provide a comprehensive approach for telecom companies.

One group within the TeleManagement Forum has spent several years developing a process architecture for telecom companies. It is assumed that no specific company will have exactly the same processes identified by the TeleManagement Forum, and that they will probably use different names for the various processes. Thus, this is a reference architecture rather than an architecture of a specific business. It is assumed as time passes that most members will move toward this process architecture and that, during the same period, vendors will tailor products to implement many of the processes defined by the model.

The architecture we describe is the third iteration that the TeleManagement Forum has developed. This latest iteration, called the eBusiness Telecom Operations
Map (eTOM), is based on earlier work that only sought to define the operations processes within telecom companies. As the companies began to implement e-business applications, however, they discovered that processes included in general and enterprise management had to be added to the architecture. One of the major advantages of e-business systems is that they integrate management and operations, and it's important that everyone have a clear overview of all the processes if they are to see how integration might occur.

Figure 4.15 shows a version of the eTOM framework, rearranged so that it matches the format that we use in this book. In effect, we rotated the basic eTOM diagram 90 degrees to the right. The customer was moved to the right side of the diagram so that processes now flow from left to right and functional units flow down, as organization charts typically do.
Figure 4.15 provides an idea of how a telecommunications company is organized. In essence, a telecom sells time on its network to customers. Since the time is sold and monitored by means of computers that track phone access, Service and Resource are important functions. Since almost all long-distance phone calls cross multiple networks, arrangements with other telecom companies—partners—are very important. We suspect that actual phone companies might subdivide their departments somewhat differently, placing marketing and service in separate departments, but remember that most phone sales and service requests come in through a common call center, so this high-level grouping works reasonably well. In any case, Figure 4.15 provides an idea of how a group of telecom managers felt they could represent their organizations.

When you look at the modified version of the eTOM diagram, it’s clear that the three shaded blocks are groups of business processes. Within each group, there are subprocesses. By splitting up the processes in the way they have, it’s unclear if Operations represents a value chain or not. The key would be if one could add the costs of all of the processes within the Operations box to determine the total cost and the profit margin on a product line—in this case, phone service. If you could, that would mean that everything in the lower two shaded boxes could be grouped together as overhead and assigned to a single value chain—Phone Operations.

The important thing isn’t the notation, however, but the fact that either Figure 4.14 would provide a telecom process architecture committee with an overview of the company. Every business process architecture committee needs something like Figure 4.15 if they are to have a standard way to describe their company’s processes and identify processes that require changes when new strategies and goals are announced.

Notice that some subprocesses occur within multiple processes. These subprocesses are marked with an asterisk to highlight the fact. Thus, the Customer Interface Management—presumably a set of customer portal management activities—is shared by the Fulfillment, Assurance, and Billing processes. Similarly, a Supplier/Partner Interface Management subprocess is shared by these same processes.

If you are not a telecom executive, you might not be familiar with some of the terms used to describe the various subprocesses. The key thing is that this business process architecture illustrates a framework that is detailed enough that a telecom process architecture committee that was familiar with its own organization could be reasonably efficient in determining just which processes or subprocesses would need to be changed to achieve specific changes in company strategy and goals. One could easily imagine an accompanying document that provided short written descriptions of each of the subprocesses.
Figure 4.15 raises two issues that we will consider in more detail later in this book. First, it suggests the possibility of a matrix management system. Someone is usually responsible for complete processes like Fulfillment. That person thinks about how all the subprocesses in Fulfillment work together to deliver services to the customer in a smooth and efficient manner. Someone else is probably responsible for Service Management and Operations. The employees that work on the Service Configuration and Activation subprocess probably report to the Service Management and Operations manager. Thus, one manager works to assure that the complete process works efficiently. Another is responsible for employees that perform some of the subprocesses within the Fulfillment process, and within other processes as well.

The other issue that is obvious when we begin to discuss a framework like eTOM is how many times the word process appears. When the chart is as simple as the one in Figure 4.15, we can live with groups of processes, processes, and subprocesses. We have already seen how the ultimate process is a value chain. Most organizations only have a few value chains. We suspect that the entire eTOM framework really only pictures one value chain that delivers telecommunication services to customers.

Other Frameworks

We have hardly considered all the existing architecture frameworks available. The U.S. government has one and several government agencies have others. The insurance industry consortium, ACORD, is working on a framework for the insurance industry, and there are probably others we haven’t heard of yet. The point, however, is that companies undertaking the development of a business process architecture are, today, in a position to greatly accelerate the process by beginning with one of the available frameworks and then tailoring it for their specific needs.

From Strategy Statements to a Process Architecture

We began with an overview of how one goes about developing a business process architecture. We saw that one could use a process description to organize the collection and alignment of data about the processes. Then we considered how an actual process architecture development team can use a process framework like SCOR, VRM, or eTOM to speed the architectural development process. The frameworks don’t provide a management strategy, or suggest specific alignments, but they provide a systematic
decomposition of the high-level processes and suggest performance measures that can be used for all of the processes in an architecture. One can use a framework to quickly fill out worksheets or populate a business process database and then tailor it and begin aligning resource information. Thus, in a very short time, a company can begin to benefit from the kind of analysis and project prioritization that one can derive from having an effective process architecture.

**Notes and References**

Once again, many of the ideas incorporated in the BPTrends methodology are derived from conversations Roger Burlton and I have had.

The organization diagram figures derive from figures originally developed by Geary Rummler.

The discussion of the Supply Chain Council's SCOR methodology and some of the figures came from the SCC's beginning workshop on SCOR or from other SCC publications. More information on the SCC is available from [www.supply-chain.org](http://www.supply-chain.org).


I am particularly indebted to Joseph Francis for his comments and insights on SCOR and the evolution of SCOR+ at Hewlett-Packard. Joe was, for awhile, the BPM manager at HP and is currently the CTO of the Supply Chain Council. He also runs his own consulting company and helps companies with framework issues. See [www.pcor.com](http://www.pcor.com).

For information on the VRM approach, check [www.value-chain.org](http://www.value-chain.org).

Information about the TeleManagement Forum and eTOM can be obtained from their Web site: [www.tmforum.com](http://www.tmforum.com). You can download publications from their site, including the specification for their eTOM framework.

For a paper on how the eTOM framework is being used in conjunction with other frameworks, go to www.bptrends.com and search for: Huang, TMF White.

For information on ACORD's Insurance Framework, go to www.acord.org.

Proforma Corporation has a detailed version of the eTOM model, created in their ProVision Workbench tool that I studied before developing my own models. For more information, contact Proforma about their Telecommunications Industry Model at www.proformacorp.com.