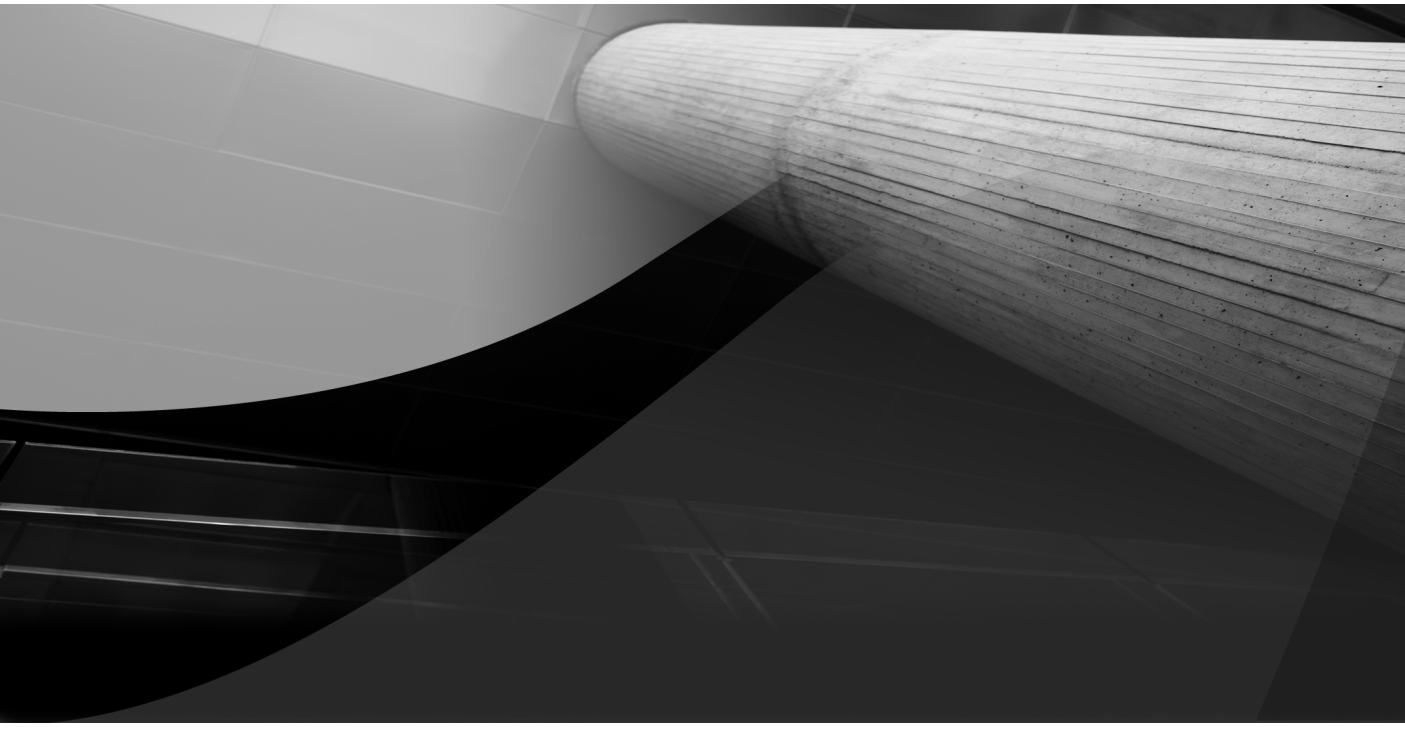
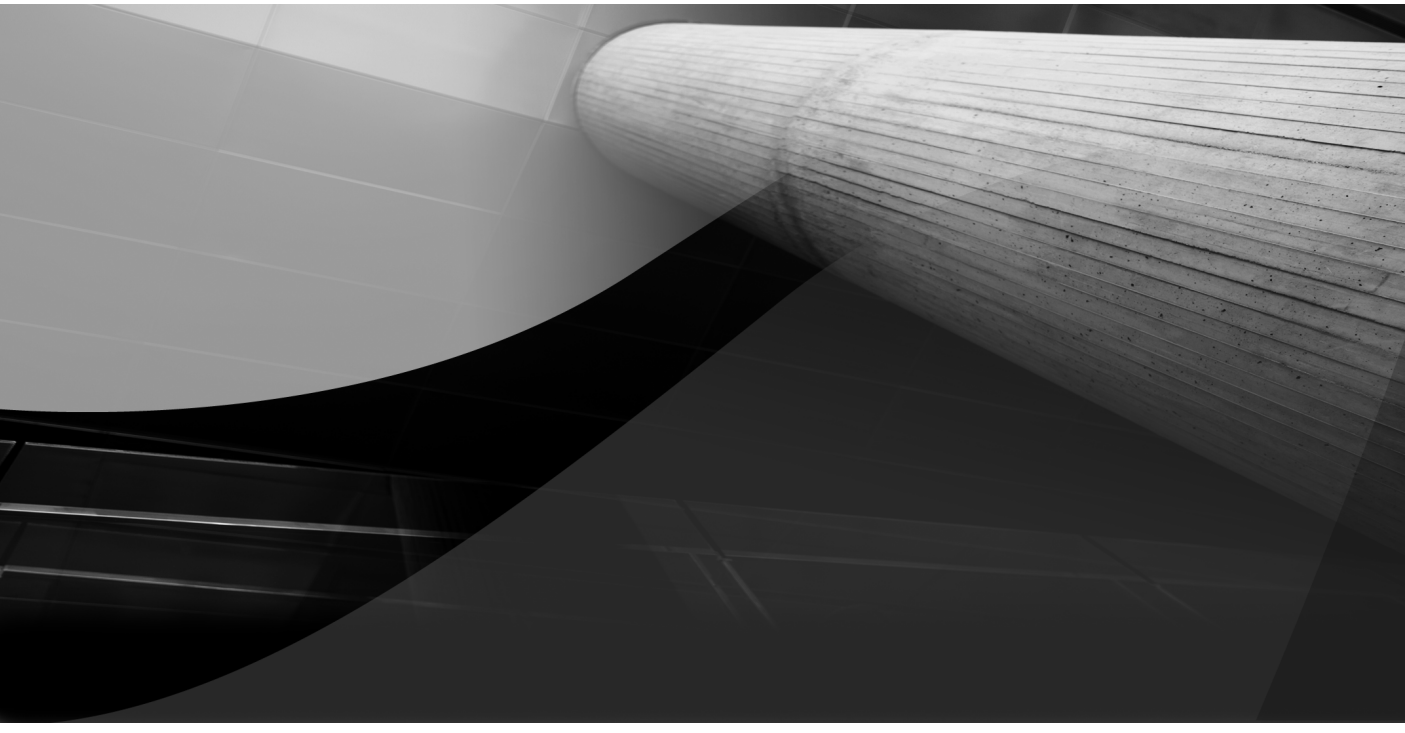


PART I

Introduction



CHAPTER 1

BPM: Background

n September 2010, ebizQ (www.ebizq.net), an online IT publisher, invited its readers to "describe BPM in one sentence." Responses ranged from BPM being something that allows us to "take control of all work activities" to a "way of thinking," with all the usual definitions in between. Interestingly, in all the explanations that the responders provided, one theme was consistent—BPM (Business Process Management) helps an organization do its job better. The reason for this belief would not be hard to understand if we consider that BPM involves comprehensive management of "business processes" that are, in turn, articulations of activities that a business does to conduct its operations.

The idea of taking control of the activities of a business, and thus enforcing a variety of disciplines to increase the quality of execution of such activities is not new. We can trace certain aspects of BPM to as early as the 18th century when the famous economist Adam Smith noted a more than two orders of magnitude increase in productivity at a pin factory via the use of the ideas of division of labor and work specialization. Of course, this "factory model" would be too simplistic for most of today's businesses. In their book *Business Process Management; The Third Wave* (Meghan Kiffer Press, 2006), authors Howard Smith and Peter Fingar have captured the evolution of BPM in three waves:

- **First Wave** This began in the early part of the 20th century and was focused on deriving higher efficiency in the day-to-day operations of businesses. The work of Fredric Winslow Taylor in theorizing disciplined approaches to achieve such goals was pioneering. The practices in Ford Motor Company's assembly line were also stunning examples of efficiency.
- **Second Wave** This coincides with the pervasive adoption of packaged enterprise applications like ERP (Enterprise Resource Planning), SCM (Supply Chain Management), CRM (Customer Relationship Management), and HR (Human Resource) systems, and the utilization of business processes embedded in such applications as a way of guiding business execution.
- **Third Wave** This refers to current efforts to recognize BPM as a holistic endeavor that a business engages in to gain efficiency and agility in its operations while creating sustainable competitive advantage.

While early IT systems took a data-centric approach to supporting business needs (epitomized by evolutionary steps through mainframe "number crunching," the invention of the spreadsheet, and database management systems), the second wave provided IT with a functional view of business operations, and many organizational structures are modeled around this functional view. Fingar's Third Wave removes the compromises and contortions imposed by prior technological constraints and allows the business to take control at the highest level—the business process. This removal of IT constraints has far-reaching implications, not the least of which is the opportunity for enterprises to become *process-centric* organizations.

As the notion of BPM was maturing, the use of statistical analysis to improve pertinent worker activities came into vogue in a variety of TQM (Total Quality Management) efforts. The Toyota Product System (TPS) and Six Sigma, pioneered at Motorola and popularized at General Electric, are noteworthy examples. It turned out that TQM procedures utilized strategies and artifacts that would be similar to many aspects of BPM as we describe it today.

Earlier scopes of BPM (or BPM-like) initiatives were very narrowly focused. Operational efficiency was the main focus and business processes were conceived as a collection of relatively simple tasks. In fact, in the late 1990s, there was a significant effort in operational efficiency improvement by the so-called "Business Process Reengineering (BPR)" initiatives, which aimed at both reducing the execution time and the cost of activities, and also pushed for the elimination of many activities altogether. The various mechanisms of discipline enforcement combined with the elimination of certain activities to maximize efficiency gain had its problems, however. After a few iterations, improvements in efficiency gains were diminishing, the processes had become hard to change, and the conspicuous reduction of the work force generated ill-feeling towards BPR and associated "automation." Also, most of the automation of these processes were largely hardwired by technical staff, and implementations were inflexible. The difficulties of translating business requirements to IT functionalities while keeping the technical systems abreast of the evolution of the business itself became a big challenge contributing to the harmful "business-IT" gap.

Modern BPM initiatives typically encompass a much broader scope in terms of activities and participants; their goals go beyond mere operational

efficiency and include the flexibility to cope with business change, intelligent exception handling and enhanced customer satisfaction, the facilitation of predictive analytics, and the triggering of cross-sell and up-sell opportunities. The technology platforms and products supporting modern BPM initiatives also benefit from the great advancements in computation and communication technologies as well as human adoption of digital collaboration.

BPM in a Nutshell

BPM, as the name suggests, is all about managing business processes (BP), typically with an aim to maintain or make better certain aspects of the performance of the business. Business processes, in turn, refer to collections of activities that a business does. As can be expected, many definitions of BPM and BP exist, varying in their scope and points-of-view. Later in the book we will delve into the finer details of BPM and BP, but in an attempt to provide some formal structure for the ongoing discussions, we will adopt the following nontechnical working definitions for them:

- **BPM** is defined as a strategy for managing and improving the performance of a business through continuous optimization of business processes in a closed-loop cycle of modeling, execution, and measurement. BPM activities span conception and discovery through deployment and management of the execution of business processes within some appropriate governance framework.
- A **business process** is a set of linked activities performed by people and systems that deliver some business value to internal or external customers.

Thus, we embrace a comprehensive scope for BPM spanning a complete life cycle and including continuous process improvement. We recognize this as a management discipline that goes beyond software development activities or the mere use of software applications. We also include related governance as a necessary element of BPM. We believe that adequate governance is required to ensure quality BPM adoption that is capable of sustained competitive advantage.

In the case of the definition of a business process, we purposely avoid the restriction of any structured association of business activities. In structured processes, steps of the process and their sequence are known *a priori,* at least within a specified set of possible options. For many business processes this restriction does not pose any real difficulty and, in fact, makes the computer realization of the business processes simpler. A straightforward order-to-cash for simple goods, a provisioning of a telephone service, supporting back-end business processes for most Internet purchases would fall under the structured business process category. However, today's businesses need to both improve and guarantee the quality execution of business transactions that involve rather ad hoc collections of activities where the exact number of tasks, and the exact nature of their association, including apparent task flows, are not known *a priori*. Business processes evolve depending on the specific context of a particular business transaction, and are based on intermediate results. As opposed to the strict sequence and prespecified branching of task flows, these transactions are guided by higher-level business norms, rules, and policies. Such transactions could also include the relatively free-form collaboration of *knowledge workers* as opposed to ordered human tasks familiar to traditional workflow systems. Management of these transactions can be formulated using what are called unstructured processes. Many case management activities, as well as pharmaceutical R&D and complicated risk analysis, are examples of unstructured processes.

We would like to point out that business processes can and do exist within packaged applications like ERP, CRM, HRM, and SCM, and they can also be created in *middleware* that usually surround such applications. While cross-application business processes clearly sit in the middleware, situations often arise where multifaceted design and operational considerations are needed in determination of the best place for creation of a business process. Oracle BPM Suite is a middleware product (in fact, it is a part of Oracle's Fusion Middleware family of products) and can be used to create independent business processes that can integrate with, or extend, packaged applications.

It may also be useful to note that the abbreviation "BPM" is also commonly used for Business Process Modeling, Business Process Monitoring, and Business Performance Management. The first two are included in our definition of BPM, while the third is concerned with financial measures of business performance to which our BPM should ultimately contribute.

Why BPM?

Presently, most companies are highly interested in adopting BPM across their organizations to help better their organizational performance. Few companies have yet achieved maturity in their BPM initiatives, while most others are grappling with early stages of adoption. Frequent reports by leading analyst firms like Gartner, Forrester, and IDC have been indicating that the improvement in process management has been one of the top concerns of senior management for the past few years and will remain so in coming years. Analysts estimate the annual BPM spend to be in the range of 5–6 billion USD and is projected to grow at the rate of 30–40 percent per year (compare this with the projected growth rate of 5–10 percent for most other business integration software markets). All in all, BPM appears to enjoy a strong positive momentum at the present time. Thus, it would be worthwhile to dig a little deeper to see why BPM is regarded as being so beneficial to a company.

BPM Benefits

As we have already noted, BPM is about managing business activities in a comprehensive way. While adopting of BPM offers many benefits, the primary motivation for using it in a given company could differ. For example, some companies may be focused on executing their activities more efficiently—that is, producing the same output with less resources like time, money, goods, and labor—while others may be more interested in creating higher business agility in order to respond better to changing market conditions. In some cases, process management may be necessary to produce sufficient visibility and create audit trails across a chain of activities so as to meet a variety of regulatory compliance requirements. Such benefits of BPM, generally speaking, can be classified as either internal or external. Internal benefits are typically efficiency, as well as worker empowerment and satisfaction, while external benefits help customers and partners derive better value from the company's products and services.

BPM delivers increased business operation efficiency by delivering integrated processes that span distributed IT functionalities and human workers.

An increase in the transaction execution automation level due to computerization of the process activities decreases process execution time, provides higher transaction volume capacity, and reduces human-generated errors. Collaboration facilities (as included in Oracle BPM Suite 11*g*) make complex exception handling much easier and cheaper, thus contributing toward higher productivity and efficiency.

Better visibility over a business transaction requires adequate monitoring of the underlying process. A process may be monitored at the top level to get general health-check data about the transactions relating to that process—for example, how many transactions are underway and how many are at what state of completion, ranges of process completion times, and fall-out percentages. Often these are the types of information that senior management are interested in. The process designers or those interested in continuous process improvement, on the other hand, would also like to track several performance parameters associated with the individual activities and responses of the performance of the edge applications that the process connects to. IT operations teams are generally concerned with system level performance of software and hardware, information regarding quick fault detection, and providing the expected level of service of the running systems for support of business continuity. Sales and marketing people would be interested in up-sell and cross-sell opportunities associated with a customer and his or her transactions. Explicit and digital description of the process showing all associated activities, rules and end systems, and events generated by the running business process instances are great facilitators of process visibility. Once all the activities in a process-based transaction are tractable, the creation of audit trails or the generation of alerts for use with compliance procedures also becomes easy. Process analyzers built into the BPMS (as in Oracle BPM Suite 11*g*) or companion tools like Business Activity Monitoring (for example, Oracle BAM) or Business Intelligence (for instance, Oracle BI) can be used to visualize a variety of process information easily.

High business agility has become an essential quality of the winning companies in today's globally competitive marketplace. Agility has to do with responding to planned and unplanned changes in business execution quickly; business processes are often an ideal place to orchestrate such changes. Collaborating business and IT participants can quickly modify existing processes as may be needed by the change imperatives. Also, reuse of either subprocesses or services (at process end points) can greatly reduce

the response time to handle change. Use of externalized and hot-deployable business rules that can alter some aspects of the process execution (as is possible in Oracle BPM Suite 11*g*) is another way to increase business agility since some of the process changes can be incorporated directly by the business analysts without requiring long and expensive IT development projects.

Figure 1-1 summarizes the key BPM benefit categories, along with some of the typical metrics that can be used to monitor the benefit levels actually achieved.

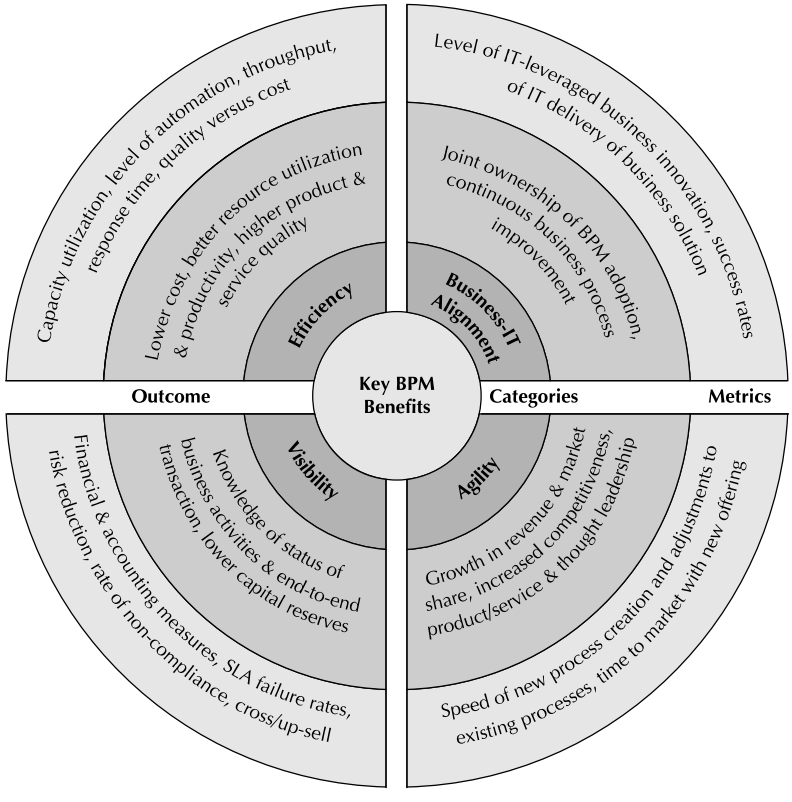


FIGURE 1-1. *Key BPM benefits*

BPM and Business Strategy

The notion of business strategy, made formal and popular by Michael Porter in the 1980s, refers to the set of concepts and prescriptions that a business adopts in order to maintain healthy growth and to generate sustained competitive advantage. For example, a business may want to provide the best price for products and services in its industry, or may excel in customer satisfaction, or may differentiate itself as an innovator in a niche market. Whatever the strategy of the business, ultimately proper management of its business processes is critical in achieving strategic goals. Hence, it is essential that BPM adoption aligns with the business strategies.

One approach to keeping BPM aligned with the execution of overall business strategies is to ensure that BPM supports and enhances the *value creation* activities and processes of the business (where value is something that the customer is willing to pay a price for). This approach is derived from Michael Porter's idea of enterprise value chains (*Competitive Advantage: Creating and Sustaining Superior Performance*, Free Press, 1985)—that is, the chain of business activities that incrementally add value on top of certain input in order to produce the output delivered to the customer (see Figure 1-2 for a schematic of an example of Porter's value chain for a software vendor).

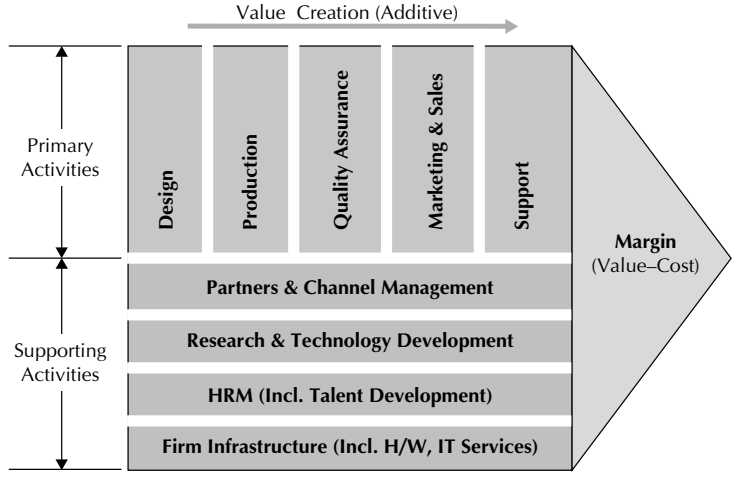


FIGURE 1-2. *An example of Porter's value chain for a software vendor*

Another approach stems from the work of Michael Treacy and Fred Wiersema around the mid-1990s. They held the view that a business has to focus on one of the following—(i) product leadership, (ii) customer intimacy, or (iii) operational excellence—to stay ahead of the competition. Treacy and Wiersema based their theory on a classification of customers based on their (the customers') main expectations from a company. Product leadership is achieved by superior and innovative product offerings. High-quality customer service and high levels of customer satisfaction are the central goals of customer intimacy. Operational excellence translates to higher efficiency and continuous improvement, and thus lower cost of products and services. BPM initiatives can align themselves to the corporate strategy by targeting business processes that serve the chosen corporate focus. As most modern businesses deal with diverse products and services in a wider demography, they may be required to excel on all three of the focus areas, albeit at different levels. As shown in Figure 1-3, it is natural to expect companies to have differing focus profiles depending on their high-level corporate goals and strategies.

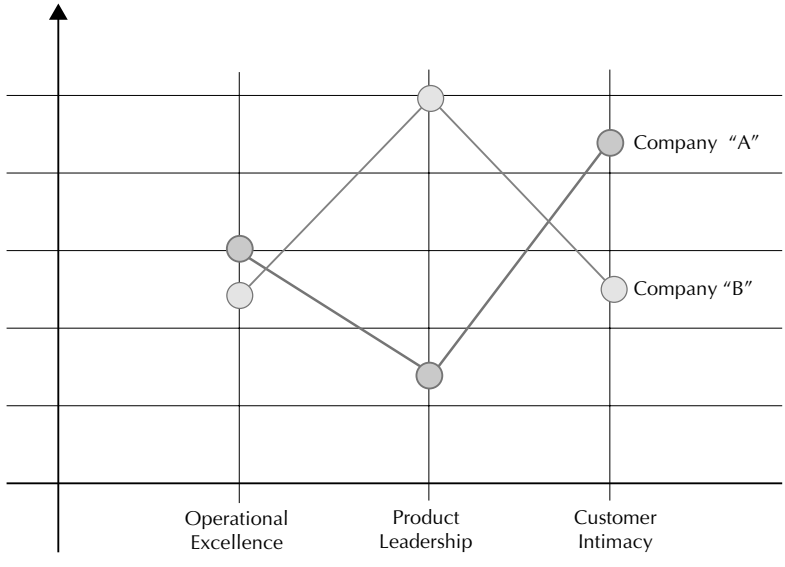


FIGURE 1-3. *Areas for organizational excellence*

In 1992, Robert Kaplan and David Norton introduced the idea of the Balanced Score Card (BSC) as a way to monitor (and help manage) the growth and leadership of a business. BSC sought to balance four perspectives of business strategy, for example, *financial, customer, internal processes,* and *learning and growth.* In the late 1990s through the early 2000s, Kaplan and Norton popularized the concept of *strategy maps* as an aid to the creation of BSCs. A strategy map is a network of value-generating strategic objectives showing cause-and-effect relations between them (the objectives). These strategic objectives are classified along the four BSC perspectives and thus provide a way to drill-down from a higher-level financial goal to, say, strategic objectives that need to be attained in the execution of business activities (the internal process perspective). The generic strategy map, following Kaplan and Norton, has four process themes: operations management (for example, supply-chain, production, distribution), customer management (such as CRM), innovation (for instance, R&D), and regulatory and social (for example, SOX or Basel-III compliance, safety, or community processes). Companies following BSC and strategy maps can align their BPM initiatives with corporate strategies by focusing BPM to improve the various process thematic strategic objectives.

BPM and IT Application Integration, Customization, and Modernization

Modern businesses rely heavily on IT and packaged (enterprise) applications like the generic ERP, SCM, HRM, CRM, and industry-specific applications like the provisioning, metering, and billing applications (for instance, in the communications or utilities industries). These applications process and store a great deal of information generated by, and passing through, the business. In order to support enterprise value chains, these silo-ed packaged applications have to be integrated for data exchange. Older enterprise application integration (EAI) practices used direct integration between applications (also called point-to-point or P2P), thus creating implicit business activity chains. This implicit nature of cross-application business processes greatly reduces the end-to-end visibility of business activities and prevents the tracking and auditing of business transactions. Also, in this type of EAI style, more and more P2P integrations are introduced as business requirements increase or are changed, leading to *integration spaghettis* that are very hard to maintain. Thus, the old style P2P EAI eventually consumes most of the IT budget and attention, and often becomes a source of errors in the execution of enterprise value chains.

While packaged applications do enable most of the information management in a business, simple out-of-the-box (OOTB) application implementations are almost nonexistent. In order to fit the packaged applications into a company's environment, some level of customization that go beyond configuration file changes are almost always necessary. These customizations, typically done by writing scripts or adding one-off coded extensions, are not cheap—some estimates put them at around 20 percent of the cost of the effort of the original implementation of the packaged application, on average, each time a packaged application is installed or upgraded. In fact, these customizations are usually the biggest bottlenecks during application upgrades; in some cases excessive customizations prevent timely upgrade of applications, thus preventing the users of the applications from realizing the benefits of progressive releases of the software. A far better approach to handling the business requirements not provided by OOTB functionalities of packaged applications is to capture them in the process management layer implemented using middleware (such as Oracle BPM Suite) outside the packaged applications. In this approach, smaller units of application functionality are packaged and exposed as *services,* which are then combined together along with additional business logic in the process layer (Service Oriented Integration, or SOI). In most cases, this approach produces solutions that have a far lower total cost of ownership (TCO) over the life of the applications, provides a mechanism to easily incorporate changing business requirements, and automatically helps with the challenge of end-to-end tracking and monitoring of business transactions, particularly when the transactions span multiple applications. Figure 1-4 illustrates the basic ideas behind P2P and BPM/SOA-based application integration styles.

Businesses have become a lot more attentive to the quality of business transactions, whether it is an external facing delivery of product or services to the customer or it is an internal supporting process. In order to provide timely service to customers, businesses are vigilant about system performance bottlenecks that could disrupt customer service level agreements (SLAs). To improve the quality of service, businesses also want to better empower their knowledge workers. In order to identify potential up-sell or cross-sell opportunities, businesses are looking for greater intelligence from their business transactions, some even in (near) real-time. Such advanced requirements are commonly met by what are called composite (business) applications that are composed over several traditional packaged applications. Often these composite applications either include, or are supported by, business processes as the components that are

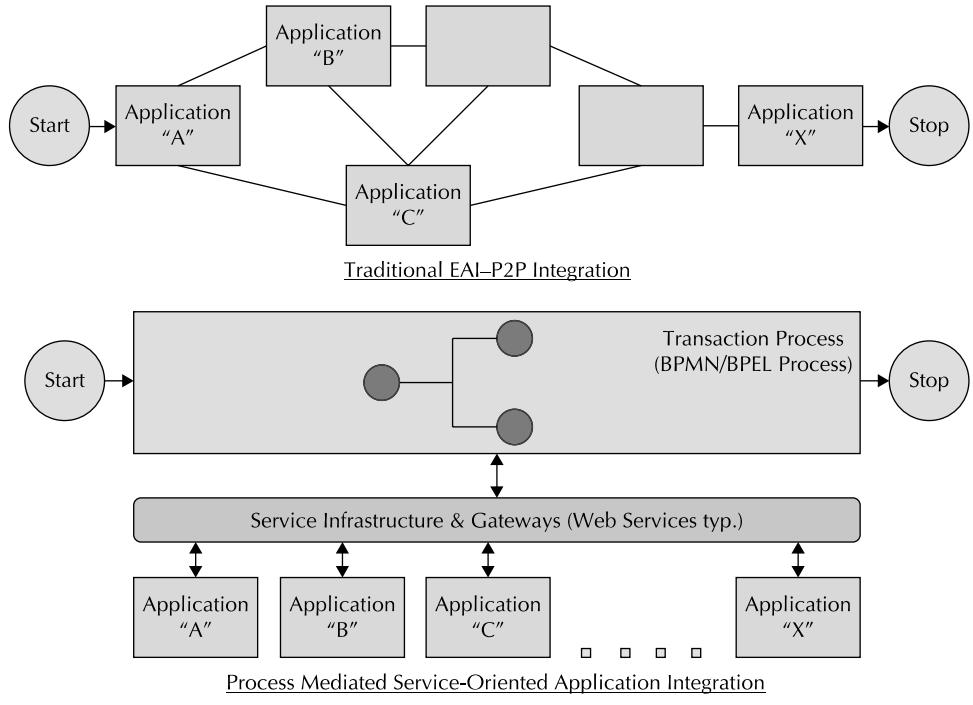


FIGURE 1-4. *Traditional and BPM/SOA-based application integration*

primarily responsible for business logic execution. Of course, besides process management, additional software components like the Web 2.0–style UI platform, business intelligence modules, and business activity monitoring and complex event processing capabilities are also typically required to build modern composite applications.

Businesses that have been around for a while are often somewhat burdened by legacy IT applications such as those on mainframes computers. Several decades ago, these legacy applications surely provided high operational efficiencies and some competitive advantages, but in modern times with high-quality yet cheap commodity hardware and significantly more flexible software platforms, these legacy applications and platforms are seen as too expensive to run and maintain, and too large and too rigid to admit business-driven changes cheaply and quickly. While most legacy applications

are closed—that is, they are black box monoliths (or at least behave like one)—currently, there are many options available to expose various portions of their functionalities as services. Once this is done, the legacy applications can essentially be treated as (relatively) modern packaged applications for the purposes of creating BPM-based composite applications.

BPM and Business-IT Alignment

The alignment between business and IT teams has long been a topic of great interest. As shown in Figure 1-5, a true business-IT alignment should be bidirectional—in other words, IT delivers accurately, efficiently, and in a timely manner, specific technology-based capabilities that the business needs to execute on the company's long-term vision, as well as its day-to-day operations (business-to-IT). The business is also proactive in creating strategic and innovative projects based on the broad capabilities of modern IT infrastructure (IT-to-business). The benefits of good business-IT alignment are well-known. At a summary level, good business-IT alignment plays a critical role in helping companies achieve sustained competitive advantage and produce high shareholder value, often five to ten times higher than the average performer in its industry, and at average IT-spend levels. However, it takes strong management commitment, changes in organizational behavior,

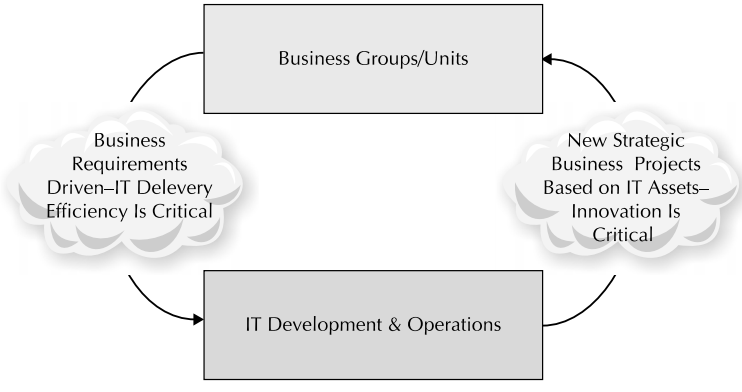


FIGURE 1-5. *Business-IT bidirectional alignment*

correct technology exploitation strategies, and some initial investment to achieve better-than-average business-IT alignment. A successful BPM adoption can go a long way in delivering this goal.

BPM, by its very definition, involves participation and leadership from the business more than most other technology projects. The functionalities of a typical BPM-based application are directly recognized by business groups, and they are typically much more eager to see BPM adoption be successful. A full-featured BPM suite such as Oracle's BPM Suite 11*g* provides multiple ways in which IT and the business can collaborate throughout the life cycle of BPM applications, starting at the conceptual and requirement gathering phases through the feedback gathering and continuous business process improvement stages. From a BPM platform perspective, this translates to providing easy and role-specific access to view various BPM assets, such as process models and business rules, performance indicators, process-related documents, and in facilitating collaborative generation and modification of such assets.

Today, business requirements change rather quickly, and traditional software development styles cannot cope up with such fast-paced changes. This leads to frustration over inadequate IT capabilities to sustain and grow the business. A suitable combination of comprehensive BPM methodology, software tools that allow rapid application development and tuning, and incremental (shorter delivery cycles of four to six months) and iterative project delivery styles that can adapt to changes rapidly and economically are necessary to minimize the business-IT gap that can arise from long and waterfall-style software development projects. Another key contributor to the business-IT gap is the communication impedance between business and IT. Using collaboration features of BPM and associated software, adopting a model-based execution strategy supported by appropriate BPM software (for example, Oracle BPM 11*g*), and by using vernacular clearly understood by all involved parties along with a suitable governance model that spans both business and IT, this gap can also be substantially reduced or even eliminated.

Business Process Types

As we have indicated before, processes are comprised of a collection of activities and information about how these activities are executed. For a process to be called a business process, it must have some relevance to the overall working of the business. Based on the type of functionality a business

process delivers, it can be classified under one of the following three (see, for example, *Business Process Change,* 2nd ed., Paul Harmon, Morgan Kaufmann Publishers, 2007):

- **Core processes** These business processes carry out the main activities of the business that typically have interactions with the customers and produce revenue. These processes are often derived from, or are closely related to, *enterprise value chains* (*EVCs*). The ability to execute core business processes correctly and efficiently has direct implications on customer satisfaction and operational efficiency. An order-to-cash business process (a process triggered by a customer order and terminating in collecting payment after the goods or services have been delivered) would be an example of a core business process.
- **Supporting processes** These business processes, generally speaking, support core business processes, directly or indirectly, by helping execute certain activities of those core business processes. For example, if the order-to-cash core process had high-level activities like "design product" or "manufacture product," then these could in turn be accomplished by specialized business processes supported by the design groups or the manufacturing groups within the business.
- **Management processes** These business processes mainly create the underlying capabilities that are necessary for core or supporting processes. For example, financial planning or budgeting processes, partner recruitment processes, and supply chain optimization processes are examples of management processes. There are also administrative processes like employee on-boarding and employee system access provisioning that may be viewed as special management processes. Management processes generate or support broad capabilities and are not usually tied to a specific business transaction.

The American Productivity and Quality Center's Process Classification Framework (see www.apqc.org) classifies core or value adding processes as operating processes and the rest of the processes as management and supporting processes—this appears to follow Porter's value chain model described earlier.

Business processes have also been characterized by the type of activities they handle. For example, *human-centric* processes were used to guide human worker activities (this is the traditional workflow type); *document-centric* processes handled and automated, where possible, the movement of documents and the further processing of some of the information in those documents (a faxed order analyzed by an OCR-based system and automatically creating a purchase order record in a company's order management system would be an example of this type of process); and *decision-centric* processes facilitated multistage and multiperson decision making (a process to determine the appropriate insurance premium for a complex risk will fall under this category). Such categorizations were helpful to keep the focus on process work and encouraged software vendors to deliver high-quality, albeit very specific, software solutions. Current approaches to BPM adoption tie higher-level business processes to value chains and to the mechanism of value creation, which have broader scopes than any of the human-centric, document-centric, or decision-centric processes. Thus, modern BPM requires the ability to handle more than one of the preceding process types simultaneously.

Generally speaking, processes that are well-known (or essentially standardized) in a given industry can contribute toward better organizational performance or some level of competitive advantage, mainly via process efficiencies. Innovation opportunities are higher in processes that are not as public and can provide a substantial competitive advantage. Clearly, a business process design, as well as creation, deployment, management, and monitoring considerations would depend on the type of process, as well as the business goals behind it.

Capturing a Business Process

One of the basic activities in modern BPM is to describe the business process in a computer-understandable fashion. Over the years there have been many efforts to come up with modeling notations that aimed at balancing the ability to capture business requirements, the ease of expression, and the syntactical adequacy required to ultimately create executable, process-based software applications. At this time, two standards, Business Process Modeling Notation or BPMN (www.omg.org) and Business Process Execution Language or BPEL (www.oasis-open.org) are receiving the highest industry adoption, both from software vendors and

from user communities. While BPMN specifies both execution semantics and graphical notations to be used in depicting a process, BPEL restricts itself to process execution. Thus, vendors have come up with their own graphical representation of BPEL modeling elements. We will discuss BPM notations in more detail later in the book. Here we would like to capture the essence of a typical business process using basic modeling elements, without insisting on high-tech rigor.

An executing business process is associated with particular business transactions (for example, a new mobile phone order or a request to cancel previously ordered books). This transaction-specific business process is an instance of a predefined business process model executing within some BPM engine or server and carries information obtained from the customer as well as additional information it generates in the process of carrying out the business transaction. Some of the information associated with a business process instance is transient (that is, they are retired by the time the process execution is completed, while some others persist for a variety of durations. A business process is kicked off as a result of the receipt of a starting trigger or a triggering (business) event—for example, as a result of an interaction with a customer. After the required processing (that is, the completion of all the tasks involved in handling the associated business transaction), the process reaches a state of completion. Thus, a process has at least one start and one end state. Multiple starts, as may be the case where the starting input could be received via different channels and at different levels of preprocessing, and multiple ends that may signify different completion alternatives, including aborted processing, are of course possible.

Tasks, chunks of actual work associated with a business process, can be either automated or manual. Automated tasks are handled by one or more computer applications using messaging mechanisms between the process instance and the applications. Manual tasks are completed by human process operators who may receive the request for completion of such tasks either directly from the BPM application or indirectly via other intermediary applications such as e-mail or a web application. When a task is completed, depending on the guiding rules incorporated in the business process model, the next set of tasks is taken up for completion, and the process execution progresses. Communications to and from a process can be either *synchronous* or *asynchronous.* Thus, to describe a process we will need the ability to represent different types of tasks and their executors, transition paths from one task to another, rules and decisions associated with such transitions, and messaging in and out of the process.

Business events associated with a business process are part of the definition of a process. Events are signatures of something that either happened or did not happen (in other words, after the wait time for something to happen expires) and are communicated as special messages. A business process can be subject to triggering events (for example, start processes, interrupt processes, and so on); the process itself can generate events for its own working (such as timer and calendar events indicating when some task must be undertaken or aborted) or for the benefit of process users (for instance, possible fraud alert, likely up-sell or cross-sell opportunities, and others).

Often we can have situations where a process must either complete all of the tasks in a given set (of tasks) or none at all. For example, if some money is transferred from one bank account to another, both accounts must be modified, holdings in one decreased and in the other increased essentially at the same time so as to keep the overall accounting states consistent. If one of the account modifications fail, both the accounts must be returned to their states before the process started and the process itself must be aborted—some remedial actions could of course follow after such an abnormal termination of the process. These two account updates are considered to be within a *transactional* boundary and the action returning all concerned systems to their original states is called a *roll-back*. A process may have several such transactional scopes and this is an important type of information that needs to be captured while describing a business process.

Just as in the case of use case descriptions, we need to cater for *exceptions* that may occur while a business process is executing. Exceptions signify deviations from the normal or ordinarily expected path of process execution (sometimes called the *happy-path* or the *sunny-day scenario*). Exceptions can occur due to data errors (for example, data types or values that cannot be understood or handled by the business process) or can be raised depending on certain data values of task states (such as loan applications above a certain amount with an applicant of less-than-adequate creditworthiness may require some human approvals where the human tasks can be raised as exceptions in the business process). Exception handling involves rework or manual work which is expensive, can lead to delays in process execution completion, and can result in the loss of income or profit and the erosion of customer satisfaction. Thus, intelligent and efficient exception handling needs to be part of a process definition.

A variety of operational policies including security policies like access control, and process performance indicators such as execution response times for the overall process and some selected task levels, are also important information that should be captured as part of a business process definition.

In order to keep the details of a business process manageable, in case of nontrivial business processes many activities in a process can be formulated as processes themselves—thus, the higher-level activity is realized as a lower-level subprocess. This leads to a hierarchical composition of business processes. Such hierarchical decomposition also helps partition the business process into groups of closely related activities, thus affording the benefits of modularity, the separation of concerns, and in many cases the reuse of existing functionalities.

Written text and visual representations are used to capture a process description. A business context diagram like the one shown in Figure 1-6 can provide a high-level summary of a process description. While common flow chart–like techniques have been used to visualize high-level pictures of business processes, the job of adequately capturing a business process goes far beyond what can be described by flow charts, and what's required are more sophisticated process analysis and modeling tools, and practices.

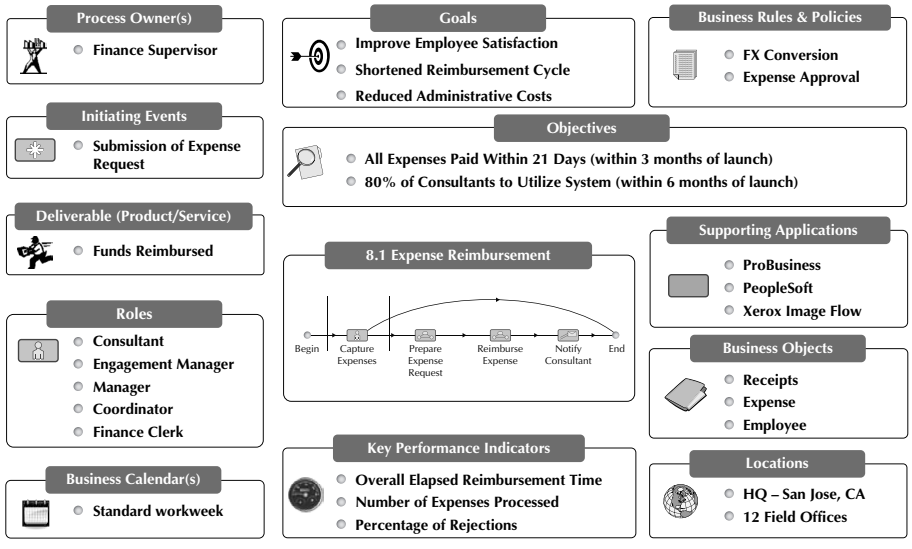


FIGURE 1-6. *An example business process context diagram*

Business Process Architecture and Frameworks

Just as Business Architecture (BA) lays out the way business operates via its organizational structure and employee actions, and just as Enterprise Architecture (EA) describes the way organization units and technology systems work in order to execute business operations, Business Process Architecture (BPA) defines the high-level architecture of all the key business processes of a business. The scope of BPA is much broader than process diagrams or models and includes the knowledge of all the subprocesses and business activities that roll up to some value chain, the interaction between the process and various internal and external human and machine resources, key performance indicators of the process, and process governance (see Figure 1-7). As may be expected, BPA is closely related to EA and BA, and depending on the scope and definitions of EA and BA in an organization, BPA may have some overlap with components of EA and BA.

BPA connects, by design, business strategies with business processes and activities that occur within the business or with its partners and customers.

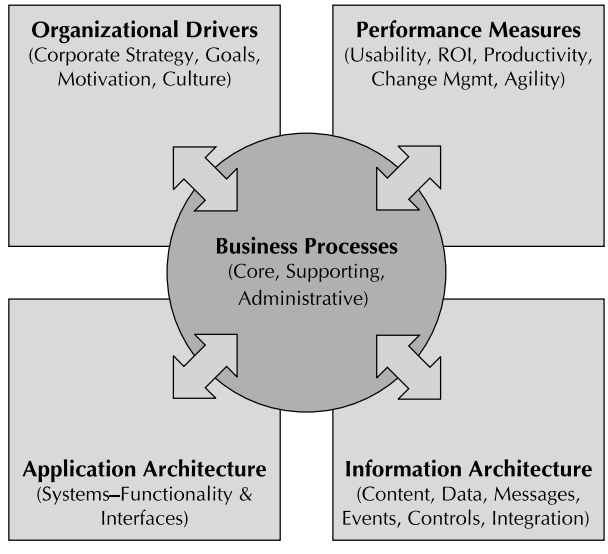


FIGURE 1-7. *Components of Business Process Architecture*

BPA facilitates the alignment of IT and HR resources, and of business policies and rules. BPA is an essential starting point of the broader enterprise adoption of BPM and guides overall process excellence and various quality improvement initiatives like Six Sigma and Lean. Done right, BPA becomes a valuable corporate asset that can be used by senior management, line managers, and employees to gain a better understanding of how their business really works and to suggest possible improvements to their business execution. Software products like Oracle Business Process Analysis Suite (OBPA) can be used to create, document, and publish BPA models.

A business process framework is part of BPA and describes how the critical value chains of an enterprise are expressed via networks of business processes. These process networks are often hierarchies of subprocesses. Process hierarchies are generally delineated using *Levels*, with Level 0 typically denoting the top-level process directly matching some value chain. Individual tasks are usually found at lower levels—for example, 4 and 5. We will delve more into process leveling later in the book (see the BPM Methodology section). In the meantime, it is worthwhile to point out here that a process framework provides a useful structure to organize business activities and to create business process performance measures at different process levels.

Enterprise architects and process architects usually have the responsibility of coming up with process frameworks that are suitable for a business, and this is not always an easy task. Many aspects of business processes must be considered, along with the diverse interests of relevant stakeholders. Fortunately, in some cases, industry community organizations have already created such frameworks, which can be used at least as a reference by individual companies. The *SCOR framework* from the Supply Chain Council (SCC, www.supply-chain.org) and the *eBusiness Telecom Operations Map* (*eTOM*) from the TeleManagement Forum (TMF, www.tmforum.com) are a couple of popular examples.

As shown in Figure 1-8, SCOR captures the business execution required to support a value chain in three levels. While SCOR starts with a supply chain as its highest level process, usually the supply chain is one of the processes of a yet higher level value chain, such as Order Management or Fullfilment. With the value chain being designated as Level 0, SCOR's highest-level process, the supply chain then becomes a Level 1 process. According to SCOR, a supply chain is made up of three basic types of activities: Source (S), Make (M),

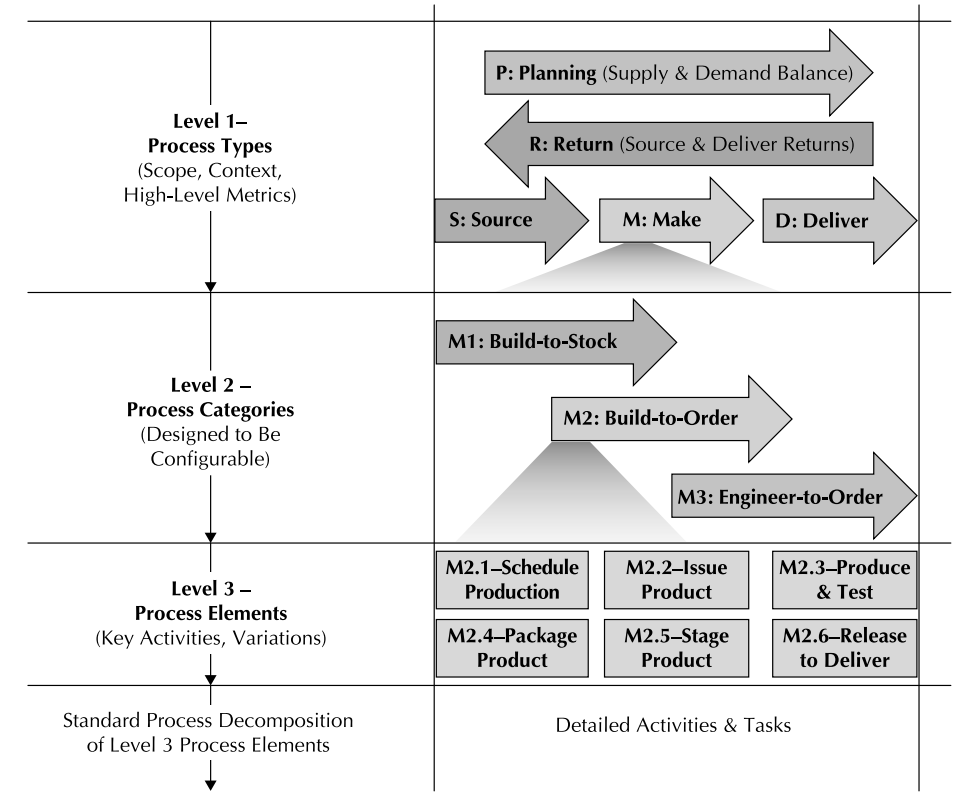


FIGURE 1-8. *Process classification using SCO*

and Deliver (D). Many types of S, M, and D exist, and these are specified in Level 2 of a SCOR framework. Level 3 indentifies the different variations for each of the S, M, and D types in Level 2. Strictly speaking, this is not a traditional hierarchical top-to-bottom decomposition, but rather a relationship diagram. SCOR does not define levels finer than Level 3—those details are left to the individual companies adopting SCOR.

Since SCC has around 700 member companies, many of whom collaborate in the extended value chains (for example, supplier-manufacturer-distributor),

SCOR's usefulness goes beyond the boundaries of an individual company. It unifies process terminologies making inter-company collaboration easier. SCOR is also able to provide industrywide process performance measures that can help a company compare its own performance against its industry peers and make business process improvement decisions to stay competitive. A SCOR *thread diagram* is a convenient and easy-to-interpret depiction of a supply chain going across multiple companies and geographies connecting input resources to output products for the customer.

SCOR framework is also helpful in mergers-and-acquisitions (M&A) situations, where the creation of the merged business execution can often be a substantial challenge. An example of the highly successful use of SCOR is noted in Harmon's book *Business Process Change,* where after the merger of HP and Compaq, the merger team was able to establish the merged business processes in about a month using the SCOR framework. Although originally designed for optimization of supply chains, the ideas behind SCOR are generally applicable to many higher-level processes and value chains, and in fact, efforts are currently underway to explore such possibilities.

The eTOM framework, developed and popularized by TMF, a telecom industry forum, is designed specifically for handling the unique requirements of telecommunications (and by extension, most communication) companies. IT and network-based technologies are heavily used by telecoms to provide their services to customers and communicate with their partners, and this is reflected in the eTOM framework. At the top level, eTOM takes a matrix view of the organizational and functional divisions (see Figure 1-9). The rows and columns of this matrix designate the high-level processes (for example, Fulfillment, Assurance, Billing, and Operations Support) and the management categories (such as Supplier/Partner, Resources, Service, and Market/Product/CRM), respectively. The individual cells of the matrix then define the next level of detail. For example, the "Supplier/Partner (S/P) Management–Billing Process" cell of the eTOM matrix contains capabilities or functionalities like "S/P Settlements and Billing Management" and "S/P Interface Management," or the "Service Management–Fulfillment Process" cell has "Service Configuration and Activation" as key functionalities or capabilities. The eTOM framework does a good job of identifying the key capabilities a telecom must master and excel in, however, it does not explicitly depict, particularly for non-telecom experts, how these capabilities relate to the more

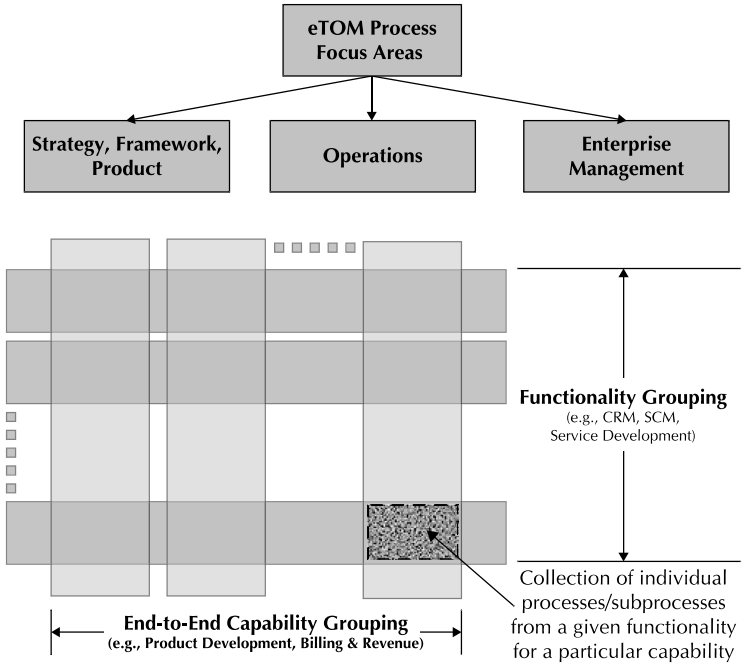


FIGURE 1-9. *eTOM process architecture strategy*

traditional notion of enterprise value chains. One would have to select the relevant group capabilities and their supporting business processes needed for a typical value chain (for instance, a Phone Service or Broadband Service offering) for any value chain type analysis.

Besides SCOR and eTOM, there are several other industry consortia led initiatives to create business process frameworks. The ACORD framework for the insurance industry is an example (see www.acord.org). It is clear that as industry groups adopt standard process frameworks, intra- and intercompany BPM adoption will speed up. However, this appears to be a work-in-progress. In the meantime, enterprise architects and process architects have the responsibility to provide their companies with process frameworks that best fit those companies. Of course, they can and should consider the pros and cons of existing frameworks like SCOR and eTOM at least as inspirations for their process framework development work.

The BPM Life Cycle

Most engineering methodologies follow similar sequences of activities spanning analysis, design, implementation, and deployment. In modern software engineering methods, these activities are applied iteratively while making incremental changes. The life cycle of an executable business process is, in many ways, similar to traditional software development methodologies, but with a particular emphasis on inbuilt monitoring and analysis driving the iterative cycles of continuous (incremental) improvement. The diagram in Figure 1-10 shows the business process life cycle with a more detailed sequence of activities in the cycle of continuous business process improvement.

In the case of business process engineering, analysis occurs in two separate activities, shown in Figure 1-10 with the labels "identification" and "define/refine." These are separated because of the different activities involved in getting started with process automation. In order to enter the continuous improvement cycle, an analysis activity is required to identify business processes and select those most appropriate for automation. Identification involves describing the process only at the highest level in order to understand its current ("as-is") state, while process selection applies analytical techniques to evaluate the process for automation. The details of business process identification and selection are described in more detail in the BPM Methodology section.

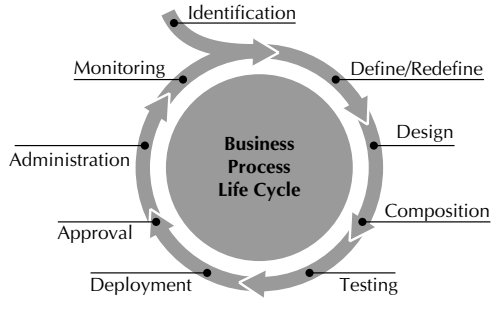


FIGURE 1-10. *BPM life cycle phases*

On entering the cycle for the first time, the business process undergoes further analysis (definition) to describe it at the next level of detail and to apply the first iteration of improvements (refinement). Subsequent iterations through the cycle focus on refinement since most of the definition exists, while analysis efforts are concerned with incremental improvements. These subsequent iterations also benefit greatly from the analytical information provided by monitoring previously deployed processes.

Design is a technical activity that explores the IT capabilities and determines the feasibility of the implementation of the process model as an executable process. Where possible, existing services are identified for use in subsequent implementation activities, but where gaps exist they must either be filled through software (or service) engineering or the process specification is returned to the previous step for rework. This is an example of various loops that can occur within the main business process life cycle.

Implementation is replaced with business application composition and associated testing. Unlike implementation in software engineering, composition involves the mostly declarative coding of business rules and the graphical "wiring" of messages between service components.

Business process administration and monitoring are closely linked in the traditional sense of OA&M (Operations, Administration, and Management) since monitoring provides information for process control dashboards; however, monitoring plays an important role in the business process life cycle since it also drives the analysis needed as part of the next iteration of process improvement.

As we will describe later in the book, the Oracle Business Process Engineering Methodology elaborates on this outline while providing a business-focused approach that is intended to augment, rather than replace, existing software engineering practices.

The BPMS and BPM Ecosystem

A complete yet minimalistic BPM tool set would include a process modeler to define the process and a process engine to execute many instances of that process. Business process execution captures and generates a lot of valuable information. As lower-level processes get connected up to high-level value chains, many different stakeholders, from IT's technical people to operations groups to senior management become interested in information about and within the business processes. For example, a head of a business unit may

want to see high-level statistics on the order management processes to get an idea of sales volumes and seasonal trends, while an operations person may be interested in knowing how healthily the business process engine (server) is running at a given time. A business analyst may be interested in altering certain behavior of some executable processes via editing business rules, while a process architect may want to relate aspects of enterprise architecture or business architecture to specific business processes in order to align organizational structures, roles and responsibilities, and success measures across divisional boundaries. As should be apparent by now, the minimalistic tool set that we mentioned at the beginning of this paragraph will not be adequate to serve the needs of all the BPM stakeholders and thus a richer definition of a BPM software system is required. So, a few years ago the notion of Business Process Management Suites (BPMSs) started becoming popular to describe this expanded BPM software system.

As an example of the capabilities of a BPMS, we can inspect Gartner's list, which includes the modeling and analysis of structured and unstructured processes and associated information with adequate richness to do the following: model most practical process situations; process change management in both design and execution stages with the *round-tripping* (that is, keeping in sync bidirectionally) of design and the executable versions of the process; manage interactions between humans and systems along with the associated content; use and manipulate business rules that drive decisions associated with processes; monitor and report the processing of information and events; generate a framework to connect to technical end-points of the process (for example, web services); and manage various process assets throughout the life cycle of the process.

A BPMS should, according to Gartner, support at least four key BPM use cases, namely, implementation of an industry or business-specific process application or solution, support continuous process improvement, facilitate process-based Service Oriented Architecture (SOA) service design and service consumption, and provide tooling support of business-IT collaboration, particularly in business transformation initiatives. As will be described later in the book, Oracle BPM Suite 11*g* is a BPMS that supports capabilities similar to Gartner's list and includes either as part of its own install or as a closely connected product, Oracle Business Process Analysis (OBPA), Oracle Business Rules (OBR), Business Activity Monitoring (BAM), collaborative and Enterprise 2.0 (E2.0)–style process portals using Oracle WebCenter, a complete application integration layer and a rich business-to-business (B2B)

integration layer via Oracle SOA Suite features, and a wide variety of business event generation, capture, and processing features (also known as Complex Event Processing or CEP).

BPM and SOA

Service Oriented Architecture (SOA) is currently a popular paradigm to develop, package, deploy, and consume IT functionalities that could be either capabilities coming from enterprise applications like ERP, CRM, HRM, and SCM, or homegrown software modules. These packages of functionalities are termed *services* that can be utilized or consumed by other applications like a BPM application. In fact, such services just become the end-points of business processes. Also, in most cases a BPM application itself can be exposed as a service, thus allowing yet other applications to leverage such BPM applications—for example, a web application could connect to a BPM application via service interfaces. As Figure 1-11 illustrates, agility delivered by SOA-enabled BPM spans both business and IT.

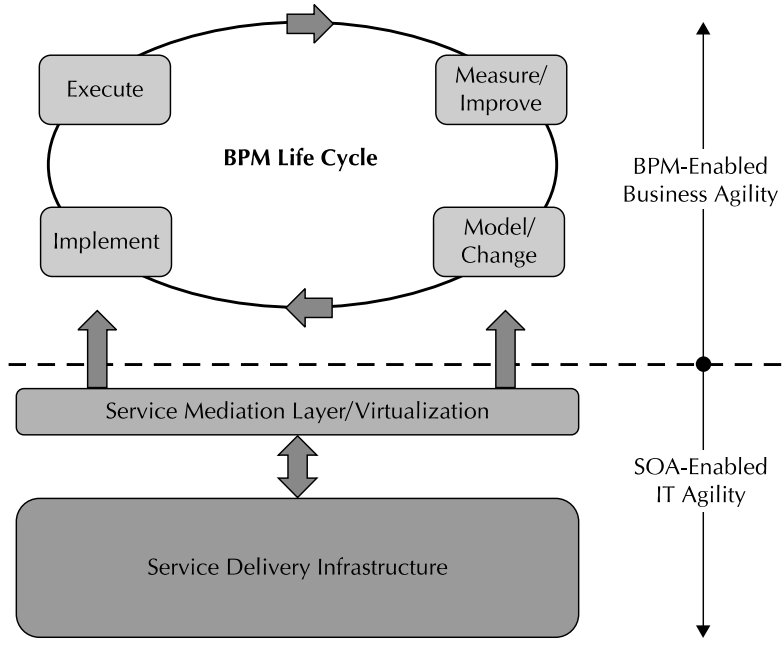


FIGURE 1-11. *BPM with SOA—top-to-bottom agility*

SOA provides a loosely connected technology platform where the service consumers (such as a BPM application) do not need any knowledge of the implementation and deployment of services in order to consume them. SOA service providers are obligated to provide service functionalities and quality-of-service (QoS) in accordance with service contract specifications used by the service consumers. When created on top of a SOA, the robustness of the overall BPM application increases due to proven and tested functionalities of the services. BPM, along with SOA, also enhances the agility and change resilience of the BPM application. Reuse of IT functionalities via published services speeds up BPM application development. A BPM application on SOA also provides a good separation of concerns: when a change is required in the BPM application, process logic level changes can be easily incorporated via edits to the process itself or by altering the associated business rules, often by business analysts or process architects without much involvement from IT developers, while changes required in service functionalities can be done behind the service interfaces by IT developers. Using versioning, it is possible to incorporate such changes into the business process without impacting existing applications. On the flip-side, process analysis phases sometimes produce requirements for new service development—this service identification helps SOA efforts focus on services that have immediate utility. Thus, a combined SOA-enabled BPM approach offers benefits greater than what either SOA or BPM could individually provide. Of course, in order to adopt SOA-enabled BPM, the appropriate modifications to methodology and practices are necessary during the planning and engineering phases. Also, SOA-enabled BPM challenges can be greatly eased by software platforms where the modelers and developers can move between BPM and SOA layers easily. Oracle's BPM Suite 11*g* is built on top of Oracle's SOA Suite infrastructure and provides great tooling support for SOA-enabled BPM.

Succeeding in BPM Initiatives

As with anything else, the success of BPM initiatives in a company depends on the expectations of the stakeholders and the chosen success measures associated with the initiatives. Both the expectation and the success measures vary depending on the scope of a particular BPM initiative. Broadly speaking,

such initiatives could be either *strategic* or *tactical.* Strategic BPM adoption success requires appropriate focus in organizational culture, software and hardware tools, and adoption methodologies, and involves adequate planning (see Figure 1-12). Such BPM projects are motivated by an overall vision of excellence of a company and enjoy the substantial commitment and participation of senior management. These projects directly align with enterprise value chains and strategy maps, support implementation or improvement of core business processes and span many organizational divisions. Successful strategic BPM initiatives help companies raise their *BPM capability maturity* to handle increasingly difficult and mission-critical processes. At higher levels of BPM maturity, a company evolves into a process-centric organization; the management and employees of the company are then quite adept in leveraging BPM for operational excellence and sustained competitive advantage—this is depicted in the structure of the organizational units and their interplays, and in the way business problems are expressed in terms of BPM components. Strategic BPM is aimed at longer-term results. Executed along an appropriate strategic BPM roadmap,

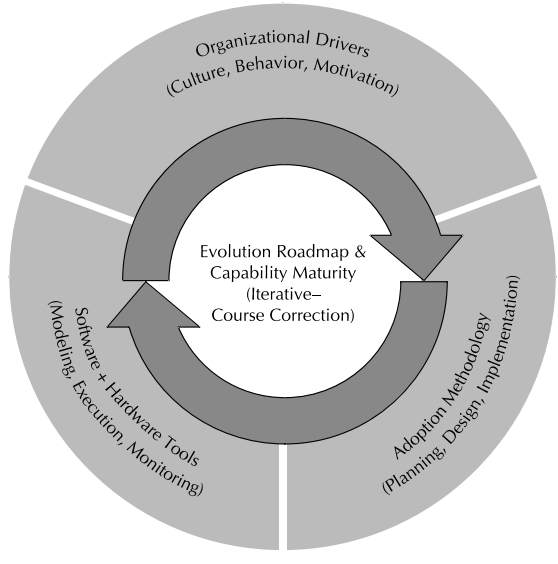


FIGURE 1-12. *Focus area for BPM adoption success*

companies achieve high BPM maturity usually in two to four years. Some of the key success measures of strategic BPM are business agility, leadership in product innovation, excellence in customer service, a better ability to execute on business transformations and M&As successfully, and high employee satisfaction.

Tactical BPM projects, on the other hand, tend to focus on solving near-term and apparently isolated problems—for example, a few known processes needing improvement or some process defects requiring correction. Such projects are usually of short duration, say, on the order of four to six months each, often involve only a few organizational units, and may not necessarily have or require senior management level visibility. It is quite common to see processes handled in tactical BPM projects as those supporting core and higher-level business processes or coarse-grain activities therein. Some of the key success measures of tactical BPM projects are the reduction in process cycle time, the level of visibility and transparency of business activities, an increase in the level of automation, the reduction in human effort, improvement in error-rates and exception handling, and the degree of abstraction of process control to business users.

A company adopting BPM at a strategic level will create an enterprise-level BPM adoption roadmap and framework for architecture and governance for the participating organizational units to leverage and share. Within or associated with strategic BPM adoption, a company should and will undertake many BPM projects, and the outcome of these projects will yield solutions to specific business problems, thus providing the incentive for the company to continue investing in such initiatives. Seen in isolation, most of these projects (under the strategic BPM adoption program) would look very similar to tactical projects. However, process implementation projects under strategic programs differ from those under tactical programs in significant ways. For example, in the context of strategic BPM programs: (i) projects will receive strong commitment and high-level guidance from senior management; (ii) business groups will own the project goals, either by themselves or in partnership with IT; (iii) individual BPM projects will be subjected to strategic guidelines and governance; (iv) where applicable, individual projects will be required to produce reusable assets for the benefit of other projects; and (v) a special organizational structure like a BPM center of excellence (CoE) or a center of competence, either virtual or dedicated, will be active in facilitating, collecting, and disseminating organizational learning related to BPM, thus help sustain and increase the

BPM maturity of the company. Also, under a successful strategic adoption program, as the BPM maturity level of the company goes up, success measures for individual projects will also steadily improve.

In order to better the chances of success of BPM programs, a company must pay close attention to a set of success enablers or critical success factors (CSFs). Some of these CSFs are:

- **Clarity of BPM program goals** Clear statements regarding program goals, stakeholder benefits, possible challenges and corresponding solution approaches must be adequately communicated to all program participants.
- **Identification and assignments of program participants** BPM initiatives involve a wide variety of participants that may include senior management, program directors, architects, analysts, operations people, and end-user experts. At different stages of the BPM life cycle, these participants will have different roles and responsibilities that must be clearly understood by all participants. Program and process owners have the additional responsibility of driving the overall success of the program.
- **BPM methodology and program governance** Adherence to a suitable BPM methodology is important for successful BPM adoption. Such a methodology outlines the activities to be performed at each of the BPM life cycle phase and prescribes best practices for executing them. In case of a combined SOA and BPM adoption, this methodology should also indicate the necessary touch-points between SOA- and BPM-related activities and specify activities that bridge SOA and BPM initiatives. A BPM methodology must also facilitate iterative project delivery strategies for BPM implementation. For BPM adoption, comprehensive and adequate program governance becomes even more critical due to the wider range of participants and activities. BPM governance must span both business and IT participants and cover both the design-time and runtime aspects of BPM implementation. (See Part III of this book for some discussion on BPM methodology and governance.)
- **Appropriate success measures** In order to monitor and guide BPM adoption to success, appropriate success measures are highly important.

These measures must not be too numerous yet must cover the interest of different stakeholders of the program—for example, senior management, business sponsors, technical experts and IT developers, IT operations, and end-users.

- **Scope management** As with most projects, project scopes must be managed with respect to the amount of functionality and time lines. It is essential that process selection ties to prioritized business requirements and the scope of individual projects are kept small enough for easier project control yet are adequate for delivering real business value.

- **BPM maturity and adoption roadmap** For a company that intends to evolve toward a process-centric organization, it needs a framework for systematically developing its BPM competency. BPM capability maturity models provide such a framework (see Part III of the book). For example, Oracle's BPM maturity identifies of the order of a hundred BPM-related capabilities, ranging from business and organizational concerns to IT development and operations tasks. These capabilities are grouped under eight labels (for instance, Architecture, Operations Administration and Management, and so on) and five levels of maturity are defined for them. The spread of the capabilities assures comprehensiveness of the overall BPM competency development, and the maturity levels indicate an organizational ability to undertake projects of a certain complexity and mission-criticality. Adoption roadmaps combine immediate and long-term needs of the company with respect to BPM maturity with BPM investment ROIs, and help guide the BPM adoption.

- **Funding model** Mechanisms that fund BPM adoption programs at project and enterprise levels can be leveraged to guide the evolution of such programs. For example, a business group funding a particular BPM implementation project becomes naturally interested in the successful completion of that project and is willing to participate more closely with the IT teams, or the program directors looking to include activities that produce sharable benefits and increase organizational BPM maturity should find some corporate budget or shared pool of resources to help accomplish their goals.

- **Change management** Since business processes impact business operations including the day-to-day work of employees, BPM adoption invariably causes a certain amount of change in the activities that are done and the way they are done. In order to avoid the usual resistance to change, adequate communication regarding the benefits of such changes and employee retraining become critical to BPM adoption success.

A primary goal of BPM is to improve the state of the business. In this regard, an organizational culture where business and IT are bidirectionally aligned provides the right environment for a successful BPM adoption. Such a culture is a deeper attribute of an organization and is one of the most difficult things to achieve. Organizational development and management techniques do exist that can help in overcoming this challenge. While a comprehensive discussion on such techniques are deemed outside the scope of this book, we can point out that effective collaboration between all program participants can go a long way in closing the business-IT gap.

Finally, we would also like to make some remarks regarding the importance of a proper BPM technology platform that support activities of participants through the BPM life cycle phases in successful BPM adoption. For example, such tools must make collaboration easy and effective. They must provide role-based tool interfaces and common metadata for process assets so that business users as well as technical developers can find the right environment to work in. When deployed, these systems should be scalable and reliable, and offer adequate visibility of the running process as well as provide policy-based management of such processes. As will be shown later in the book, Oracle BPM 11*g* fulfills these requirements nicely.

Summary

In this chapter, we provided an overview of different aspects of BPM and its adoption in a company. Currently, interest in BPM is quite high, resulting in a lot of BPM-related activities by software vendors, analysts, consulting companies, industry organizations, and end-user communities. Thus, it is expected that BPM as a discipline is likely to mature rapidly in the near future.

From BPM technology and solution architecture points of view, we are likely to see a greater use of collaboration and social media, E2.0-style portals as the face of BPM applications, the leveraging of events to manage processes as well as to derive additional value from process transaction, and increased adoption of SOA-enabled BPM. Also, contemporary momentum around cloud computing will impact the way BPM tools and engines are developed, packaged, sold, and used.