# **BUSINESS PROCESS TRENDS**

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NEWSLETTER

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## **Evaluating an Organization's Business Process Maturity**

In this issue of BPTrends Newsletter, we are going to describe a light-weight, generic approach to evaluating the Business Process Maturity of an organization. Our categories are loosely based on the categories described by CMM [1], but we propose less formal ways of evaluating at what level an organization is functioning. We developed this approach because we occasionally audit organizations to determine the current status of their business process efforts. In some cases, we simply provide a snapshot of where the organization is today, as a benchmark that they can use to determine progress. At other times, we conduct an audit as a prerequisite to recommending how they might improve their business process efforts. In either case, our audits are informal and brief. We usually ask managers to fill out guestionnaires and then visit the site, review documentation, and ask guestions to selected managers. The entire analysis effort takes from one to two weeks. Later, we prepare a report. Thus, unlike CMM evaluations that can be very rigorous and take months, our effort is usually confined to a few days and only aims at an informal statement of what the organization is doing. Equally important, we only consider maturity, in the sense that it is defined in SEI's CMM, as a small part of our auditing effort, and put as much or more emphasis on the specific business process projects and initiatives that companies are undertaking. In this issue of BPTrends Newsletter, however, we won't consider the entire audit process, but will confine ourselves to providing an overview of how we approach the characterization of Business Process Maturity.

## The Concept of Maturity

The basic concept underlying *maturity* is that mature organizations do things systematically while immature organizations achieve their outcomes as a result of the heroic efforts of individuals using approaches that they create more or less spontaneously.

Some CMM books define *maturity* more rigorously, and use the terms *predictability*, *control*, and *effectiveness*. *Predictability* refers to the use of schedules, milestones, and goals that are met. Immature organizations often create schedules, but then often miss their milestones or goals by wide margins. Mature organizations create schedules and consistently achieve them. *Control* refers to the consistency with which organizations meet their goals. Mature organizations meet their goals over and over again with very little deviation. Immature organizations are never that sure which goals will be met and have little idea how likely it is that a milestone will be achieved within 8 hours of the time assigned or within a week of the time assigned. *Effectiveness* refers to achieving the right outcomes in an efficient manner. Mature organizations often achieve the precise goals they commit to achieve. Immature organizations often achieve some, but not all, of their goals. Moveover, in many

#### **Executive Summary:**

In this issue of BPTrends, we discuss how a manager might informally evaluate the maturity of an organization responsible for one or more business processes. Although our approach is derived from the CMM model, it relies on informal judgements to come up with a rapid characterization of the business process maturity of an organization.

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The Concept of Maturity Approaches to Maturity The CMM Levels: An Overview Establishing Scope Level 1: Initial Level 2: Repeatable Level 3: Defined Level 4: Managed Level 5: Optimized A Checklist and a Worksheet Summary



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cases, the quality may not be as good and the costs may behigher than management would like.

Put another way, mature organizations have systematic processes and documented ways of doing things. Data has been collected in the past and is used to predict what will happen when a similar effort is undertaken in the future.

#### **Approaches to Maturity**

As the SEI and others have attempted to create and apply maturity models, two different approaches have emerged. One approach is based on levels or stages. This approach assumes that sets of related capabilities are achieved more or less together, and that one set is achieved before another. In this view, levels of maturity are defined and an organization is spoken of as being on one level or another, or, more often, as being in the process of moving from one level to the next.

The alternative approach is usually termed a continuous representation. The emphasis of this approach is on the fact that organizations often show a mix of capabilities. For example, the same organization may have some capabilities typical of Level 2 and others typical of level 4. Thus, those who emphasize continuous representation tend to avoid the idea of levels, and focus on the specific capabilities that characterize an organization and on capabilities that are yet to be achieved. Reality, of course, is more complex than either approach. Different departments within a single organization may be at different levels. Some groups may be easy to classify as Level 2 groups, while other groups in the same organization may show an inconsistent mix of characteristics ranging from 3 through 5. The larger the organization you examine, the more you will find contradictions between practices in one area and another.

In spite of the problems associated with an approach that emphasizes a single level, we usually use such an approach because it makes for more dramatic presentations. We have found that organizations are often better motivated if they have clear goals, and that levels often make it easier to provide clear goals. Thus, we usually characterize organizations in terms of levels. We always emphasize that there are exceptions, and that the levels we speak of are simply generalizations, but using the term "levels" is a useful way of talking about how mature organizations are in their use of and support for business processes.

## The CMM Levels: An Overview

The SEI software CMM defines five states or levels, and we use their terminology. Figure 1, on page 3, illustrates the five levels.

• Level 1 organizations are immature. Their processes are ad hoc, and undefined, and their projects unpredictable.

• Level 2 organizations have started to focus on processes and have defined some of their major processes. They can repeat some processes with predictable results, while other processes are not yet well controlled.

• Level 3 organizations have defined all their basic processes and have some degree of control over them. They have begun to emphasize the collection of data and use measures to help manage their processes.

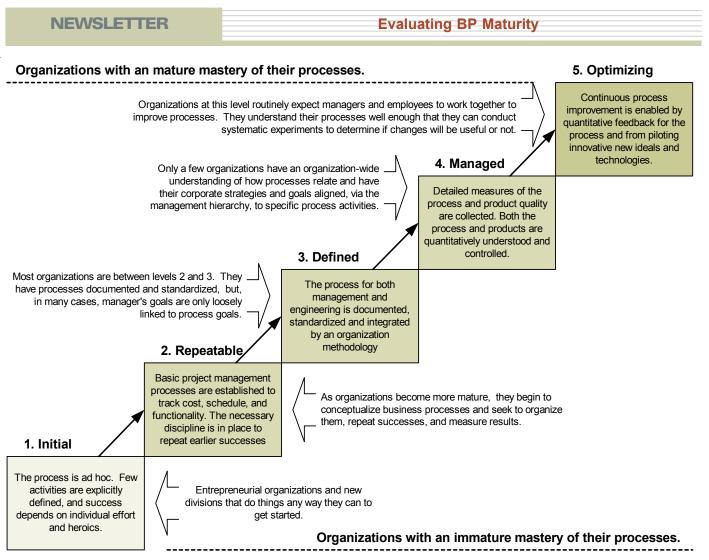
• Level 4 organizations have put a lot of emphasis on the management of processes. They have good process measures and gather data consistently. Their managers rely on measures and data when establishing goals or planning projects. Equally, there is a hierarchical alignment among project managers, so that the achievement of subprocess goals reliably contributes to the achievement of super process goals, and all work to achieve the organization's overall goals.

• Level 5 organizations have taught their employees about processes and enlisted them in a continuous effort to refine and improve processes.

Before trying to assign levels to specific groups, we must spend some time thinking about how to place boundaries around the organization we intend to evaluate. If this isn't done with some precision, one runs into all kinds of problems, because different groups within the same organization are at different levels.

## **Establishing Scope**

The ideal engagement, from our prespective, is a small group that is responsible for one subprocess. It's usually easy to characterize such a group with percision. A larger group that is responsible for a few subprocesses, all derived from one value chain, isn't too hard to characterize. Larger groups responsible for processes from different value chains or product lines that cut across multiple functional groups require a lot more work. As the assignment gets more





complex, you need to be more precise about defining the organization, and its subsidiaries, and how to characterize different groups independently. In other words, if the organization you are evaluating is anything other than a very small, very focused company or department, you will probably want to assign different maturity levels to different groups within the organization. In any case, if more than one process is involved, we recommend evaluating each process, independently. Is the process well defined? Is it measured? How is it managed? Once you have determined the maturity of the various processes, you can decide if it is appropriate to characterize the organization as a whole, or simply say that it functions on multiple levels in its management of multiple processes.

Organizations that are truly immature don't think in terms of processes. In those cases we find ourselves talking about trying to define the maturity of a functional unit of some

kind. In essence, if we say that a manufacturing organization is at Level 1, we are saying that the functional group doesn't think in terms of processes, and hasn't made any serious effort to define their processes. Instead, they rely on goals and measures associated with the manufacturing function, not with specific processes to which manufacturing might contribute.

Moving beyond Level 1 organizations, we are faced with trying to scope the organization we are going to characterize in terms of the process or processes the organization uses or supports. In these cases, it is important to have a standard way to speak about processes.

Different organizations have different ways of describing how they are organized. The description, alone, will usually tell you a lot about the process maturity of the organization.



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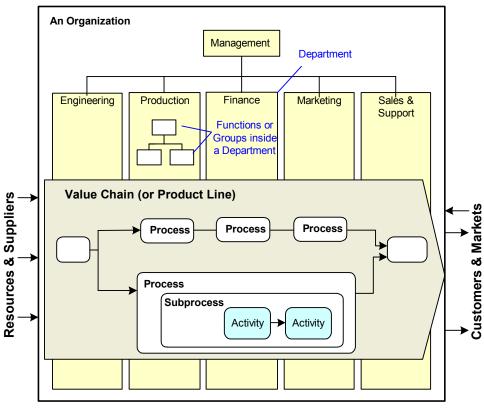


Figure 2. Functional Units, Value Chains, and Processes.

Completely immature organizations usually think of themselves in terms of functional departments, and diagram themselves by means of a traditional organization chart like the one shown in yellow in Figure 2. More mature organizations that have begun to think in terms of processes usually speak of *value chains*, or, more likely, product lines. Value Chains were initially defined by Michael Porter in the mid-Eighties.[2] A value chain includes all of the core and support processes necessary to take raw resources and turn them into the finished products that you sell to your customers. From an accounting perspective, if you add the costs of all of the activities that occur within a value chain and subtract them from the monies paid by customers for the products, you can determine the gross profit your organization achieves as a result of producing the product.

Organizations that have thought about it can usually tell you exactly what value chains they maintain. Most organizations can't, but they usually can describe their product lines. The term product line is usually a little more vague, but it often serves the same purpose. Consider Figure 2 again. Most organizations maintain, formally or informally, some kind of matrix organization. They have functional units like Sales and Manufacturing and they have product lines that focus on the creation of products to satisfy specific groups of customers. Value chains and major business processes usually cross multiple functional units. Thus, for example, a Supply Chain system for a given product line will probably include procurement, production, delivery, and service, as well as HR, IT, and finance and accounting. Similarly, a single functional unit, like Marketing in Figure 2, will be responsible for processes or activities that are parts of different business processes within a single or multiple value chains.

It is rare to be asked to evaluate an entire value chain, and it is uncommon to be asked to evaluate a major business process like a Supply Chain or a Sales and

Marketing Chain. More often, one is actually being asked to evaluate the process maturity of some functional group that has only an incomplete control of a process or subprocess, or, worse, a unit that contributes to multiple value chains or business processes. One needs to be as precise as one can about the scope of the organization and the processes one is evaluating. You need to know just which functional units you will include in your evaluation and just which value chains and business processes fall within the scope of your evaluation

It is important to create something like the organization diagram shown in Figure 2 and to highlight just which functional units and which process or subprocess elements will be discussed in your evaluation.

## Level 1: Initial

We have already said about as much as we can say about Level 1. This level is characterized by a lack of process maturity. What processes exist are vaguely defined. In most cases, processes are assembled on an *ad hoc* basis. One sees this commonly in small consulting organizations,

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and sometimes in large consulting groups that specialize in very large, complex projects. Every project is a new challenge. The organization assigns a gifted consultant who meets with the client and crafts a project that seems to fit the client's demands. Product organizations have usually put some effort into their core processes and have some overall idea of the sequence required to produce a product.

The best advice one can give a Level 1 organization is to define its processes.

## Level 2: Repeatable

Level 2 organizations have begun to climb the maturity ladder. They typically have one or more of their core processes defined. Often they have defined the overall process into phases or a set of key milestones, but haven't got around to defining subprocesses or activities in sufficient detail.

Ask managers how they plan projects or runs. What kinds of templates do they have? How do they make projections? Look at the kind of data the organization gathers and how the data is classified. Ask managers how they track progress. Ask them how they identify exactly what happens when something goes wrong, and how they assign blame.

Do managers think in terms of processes? Do employees think of their work in terms of some process that contributes to some organizational goal or product? Does IT think of its systems as supporting processes, or do they simply think in terms of creating one more application for manufacturing or sales – an application to accomplish a specific task? What kind of data do managers gather? Does the data describe process events, or something else?

Evaluating Level 2 organizations usually comes down to identifying where their current descriptions are incomplete and establishing how their incomplete descriptions limit how well they manage their existing processes.

Without going into any details, most of the notation systems, process modeling tools, and methodologies developed in the mid-Nineties were designed to help groups define and refine their business processes.

## Level 3: Defined

Level 3 is achieved when an organization has defined its existing processes. If an organization has achieved Level 3 and something goes wrong, the organization is able to quickly determine the point at which the mistake was made and take corrective action.

The difference between Level 2 and Level 3 is usually easy to detect. Most organizations fall between 2 and 3. This simply means that they have defined some of their processes and not others. Typically, an organization somewhere between Level 2 and Level 3 has some nicely defined processes, but hasn't figured out how the processes they have defined interface with each other.

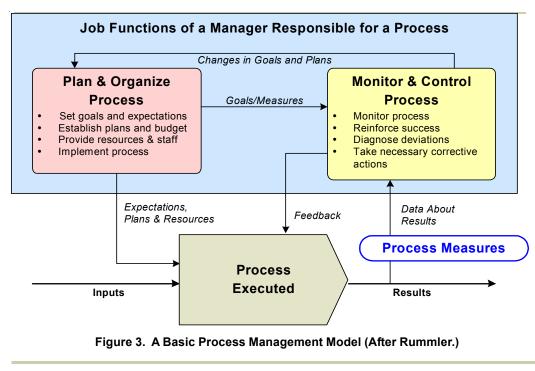
It's usually harder to make sharp discriminations between organizations at Level 3 and those at Level 4. To achieve Level 3, an organization has to have well-defined processes. Typically, in the process of defining their processes the organization has also established some measures and has oriented its management efforts around its processes. The trick comes down to discriminating between organizations with informal or incomplete management and measurement systems and those that have hierarchically aligned measurement systems and similarly integrated process management systems.

At Level 3, an organization is trying to monitor and control a specific process. At Level 4, each specific monitoring and measuring effort is also part of a hierarchically aligned system that assures that processes function to achieve strategic goals.

#### **Process Management**

Before considering how to integrate management and measurement, let's simply consider how one manages a process. Figure 3 shows the basic process management model that we first learned about from the work of Geary Rummler[3].

Figure 3 provides an overview of a manager's responsibilities. In effect, relative to some specific process or activity, a given manager has the responsibility for setting goals and expectations, planning the process or activity, providing resources and staffing, monitoring outcomes, and taking actions if the outcomes deviate from established goals. We can use this same basic diagram, whether we are defining the role of a business line manager, a department head, a middle-level production manager, or an accounting supervisor. Work gets done in processes. Managers are responsible to see that work gets done in the processes they manage. To emphasize our particular concerns, we have divided all managerial tasks into two broad and somewhat arbitrary processes: Planning Processes and Managing Processes. Within each of these two categories, we have listed some specific tasks.



and take corrective action if the process isn't producing adequate and timely results. In other words, managers are responsible for the outputs of activities, whether they are performed by employees or by systems.

**Control Process.** Once the process is functioning, the manager is responsible for gathering data about the outputs or results of the process. In effect, the manager turns goals into specific measures and then gathers data to see if the measures are achieved. If the manager can take actions to reward and sustain the sub-processes, activities, and

Plan Process. In essence, a manager is first responsible for defining the process he or she is assigned to manage. Even if the process is already exists, and was defined by a previous manager, the new manager is responsible for understanding it and satisfying him or herself that it is as efficient and productive as possible. This begins with a description of the scope of the process and a definition of its goals or outputs. To avoid a silo mentality, in an ideal organization, the manager's manager would explain the super-process or value chain that provides the context for the manager's specific process so the new manager can see how the specific process relates to others, and, ultimately, to a customer. Once the process itself is defined and jobs and tasks are understood, then the manager is in a position to establish a budget. A budget requires that the manager consider the space and resources required for the process, the people or hardware needed and a plan for how the process will be established and maintained. Once a budget and a plan are complete, the manager is able to implement the process and maintain it.

**Process Executed.** The process itself might be something done manually, by employees, something done by a computer software system or a machine, or some combination of these. These concerns are important when one establishes a budget and a plan, but they don't really affect the overall nature of the managerial tasks. In all cases, the manager must plan for the process and then monitor it

individuals responsible for the success. If the measures aren't achieved, the manager must determine what is causing the deviation. This involves examining the process in detail and locating the specific reason for the deviation. Then the manager must take preventative or corrective actions to assure that the measures are met. This may require changes to software systems or changes in the way employees perform specific tasks.

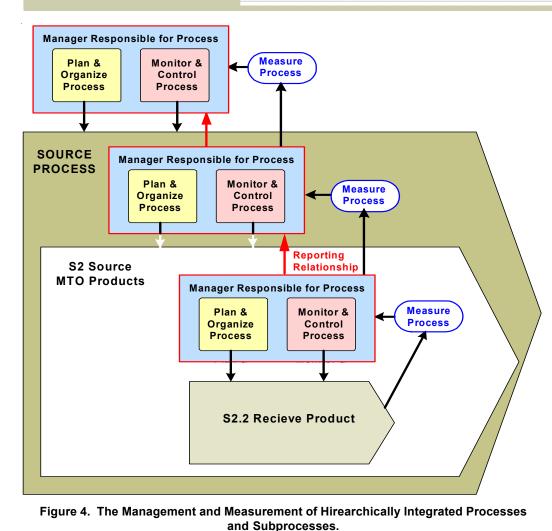
If the manager is near the top of the management hierarchy, correcting a deviation will typically involve holding one or more lower level managers responsible for deviations in subprocess or activities they are responsible for managing. If the manager is a supervisor, corrective action usually requires holding an application, machine, or an employee responsible for the problem. If the problem involves a software or machine problem, the manager must usually consult with the software developers or engineers responsible for the system or machine. If the process is performed by an employee, then feedback, retraining, restructuring the job, or punishment are all options.

In evaluating the maturity of an organization, our primary concern is the degree to which the organization conceptualizes its management and measurement processes as we picture them in Figure 3. Do the managers realize that they are primarily responsible for managing





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processes to align their work to assure that, ultimately, the value chain is functioning to meet the organization's goals.

If one follows the CMM literature, one would place more emphasis on the quality and quantity of measurement processes in discussing Level 4. We have found it more useful, however, to focus on hierarchically interlocking measurement systems, managerial systems that are organized to reflect process hierarchies, and on aligning resources to support processes.

Figure 5 provides one way to think of the kinds of alignment we look for in considering if an organization is at Level 3 or at level 4. In fact, of course, since most organizations show some of the characteristics we cite and not others, they are between the two levels, moving upward from Level 3.

One of the ways that we judge

processes, or do they conceptualize management in some other way?

The primary interest we have at this point is to point out how goals and measures are used by managers to assure that processes work as they should.

## Level 4: Managed

If Level 3 is focused on developing a complete and integrated description of process, Level 4 is focused on developing a complete and integrated process management and measurement system.

Figure 4 extends the management model we just considered by suggesting how a series of managers might use measures derived from subprocesses, processes, and even larger

how well processes are organized, and the degree to which they are under the control of the manager, is by looking at the alignment between a given process and its support facilities. Processes are implemented by people and, in most cases, by software systems. We usually ask how well employee job descriptions are aligned with process definitions and measures. In an ideal case, people should be evaluated on achieving goals that are aligned with the goals of the process. Similarly, knowledge bases and training programs should also be aligned to support processes. IT applications should also be aligned to processes.

The key to this approach is to ask how you judge if a given software application is useful and worthwhile. You can try to evaluate the software application by some internal or abstract criteria, but this is the very opposite of what a process orientation is all about. The emphasis on process is meant to provide better ways to manage and evaluate.



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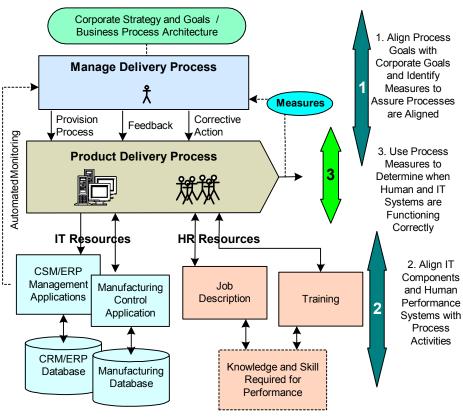


Figure 5. Aligning Measures, Management and Resources.

One works from strategic goals, success in the marketplace, and customer satisfaction to determine if processes are more or less successful. And one then judges the success of software applications by determining how they contribute to the success of specific processes they support.

Or think of it this way: Your organization decides to shift direction and put more emphasis on a given product line. New goals are set and plans are made to expand the line and overall production quotas. You are the manager of the supply chain process that supports the product line. You will need to scale up, hiring new people and extending software applications, to facilitate more efficient production. Is all this as easy as we've made it sound? Do you know who to talk to and what jobs and systems to speak of as you ask various support managers to help you meet your goals? If, instead, you find yourself sitting in a meeting with IT managers as they discuss what applications might be involved, or might have to be changed, then you know that your process isn't as well defined or aligned as you might wish. Worse, if you find it impossible to communicate your priorities to IT, and find that your project, which senior management has designated "top priority" is way down on the IT priority list, you know that IT is not business process oriented, no matter how much they may talk process. Horizonal and Vertical Alignment We sometimes refer to the difference between Level 3 and Level 4 in terms of horizontal and vertical alignment.

Horizontal alignment means defining all the processes, subprocesses and activities that make up a value chain. It means being able to follow the flow of raw materials or parts from when they enter the company through each of their changes until they emerge as products delivered to customers. (See Figure 7.)

Vertical alignment, on the other hand, refers to determining measures for specific processes, using those measures to manage the process, then going further to assure that the goals achieved by one activity, process, or subprocess contributes to the success of the relevant super-processes. It also means assuring that jobs are defined

in terms of processes and that IT applications are organized in terms of the processes they support. Put slightly differently, vertical alignment means that each element of each process is not only achieving the goals of the processes it is a member of, but that it is also achieving the strategic goals of the organization as efficiently as possible.

Significantly, although the tools and methodologies developed in the mid-Nineties are good at defining and integrating processes, they aren't very good in assisting companies with the analysis of measures and the alignment of management processes. Most of the authors who wrote books in the early Nineties, urging companies to redesign their business processes, have followed up their earlier books with a second book urging companies to manage processes. In most cases the advice has been general, and few specific tools and techniques have been offered.

#### SCOR

As an aside, we usually recommend that people unfamiliar with the Supply Chain's SCOR methodology examine it to see how it supports and fails to support business process maturity. SCOR is an open effort by the supply chain

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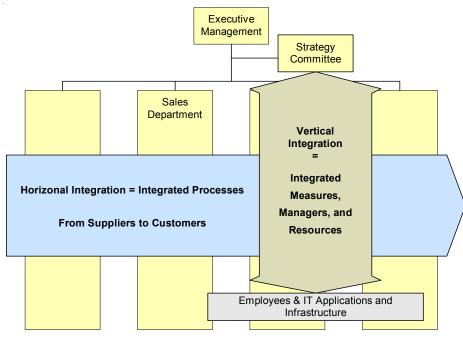


Figure 6. Organizations and Functional Processes.

managers of some 700 companies to define and improve supply chain processes. The SCOR framework defines the top three layers of a supply chain process. In essence, SCOR starts just below the value chain or product line level, and defines a complete supply chain to support a given product line. The SCOR framework stops short of what many would consider a complete definition of a supply chain process, and leaves the activity level definitions to specific companies. The SCOR framework also provides a detailed, integrated collection of process measures that can be used to align supply chain processes from a product line strategy through the subprocess level. SCOR also emphasizes that every supply chain process must have associated management processes that it terms Plan processes. What they do is excellent, but doesn't include any control elements and is, therefore, an incomplete characterization of process management. Similarly, SCOR offers no advice on how to organize a supply chain management team within a company to assure that every manager is aligned as efficiently as possible. In spite of its limitations, however, SCOR provides an excellent model for the framework necessary for moving from a Level 2.5 process maturity to a level 3.5 maturity. And, of course, SCOR is a work in process, and we can hope that as time passes SCOR will be extended to provide an even more detailed framework that will facilitate movement from Level 2.5 all the way to Level 5.[4]

#### Level 5: Optimized

Optimization occurs, in the SEI CMM schema, only after processes are well managed and measured. In essence, optimization occurs when the manager works with the people engaged in performing the process to figure out how to further improve the process. There are many different ways to accomplish this, but the best known approach is defined by Six Sigma. If your organization has a well defined, systematically measured, and well managed process, and the employees working on the process take part in more or less continuous Six Sigma efforts to improve the process further, then, in effect, you have an optimized process.

In an ideal world, one would introduce Six Sigma after an organization was at

Level 4. In most cases, Six Sigma has been introduced before the organization has achieved Level 4. A Six Sigma team might well help to define measures for a given process and provide the manager with a better way to monitor and control the process, in effect, helping to move the process toward Level 4. In some cases, Six Sigma teams introduce measures, but are so narrowly focused that they aren't able to assure that the specific process measures are well aligned with those of larger processes or with the organization's strategic goals. In these cases, the Six Sigma team starts the process toward Level 4, but is unable to complete the transition.

Thus, one should not rely on the presence of a Six Sigma program to prove that a process or organization is at Level 4. This returns us to the discussion we had at the very beginning of this issue. Although *levels* is a useful concept, real organizations are more complex. In most cases, one needs to apply the idea of levels with considerable discretion, recognizing that real organizations, and even rather small groups within a large organizations, may be operating at many different levels at the same time.

## A Checklist and a Worksheet

By way of a recapitulation, we offer a checklist you can use to help characterize the level of an organization, and present

Checklist for Evaluating the Maturity of an Organization/Process		
Level	Criteria	
Level 1 Initial	Processes are not defined.	
Level 2 Repeatable	Some processes are defined. Subprocesses and activities may not be defined. The relationship between specific processes and super-processes and, ultimately, value chains is not well defined. Company owns process modeling tools and is investing in process redesign methodology.	
Level 3 Defined	Most processes are defined. Subprocesses and activities are defined. The relationship between specific processes and super-processes and, ultimately, value chains is well defined. Some process measures are defined. Some managers conceptualize their role as being responsible for managing a process. Some resources are defined in terms of processes. Company maintains processes in a repository.	
Level 4 Managed	Processes have well defined measures that are vertically integrated. Processes managers conceptualize their role as being responsible for managing processes, and there is an alignment among all the managers responsible for a given value chain. Data from process measures is recorded, analyzed, and consulted in projecting future outcomes. Job descriptions, knowledge management systems, and training are aligned to processes. IT applications are aligned with the processes they support. Company uses SCOR to organize its supply chain process.	
Level 5 Optimizing	Company processes are well measured and managed. Process improvement teams exist that constantly work to improve the effectiveness, efficiency, and consistency of existing processes. Company has Six Sigma program and process has trained Green or Black Belt on team.	

a portion of a worksheet we use during audits to record information about the levels of various processes.

Table 1 provides a summary of the key points we have considered. Using this checklist, you can look at processes and assign them a level, and make some notes about features the process has or doesn't have. Figure 7 shows a portion of a worksheet that we use when auditing an organization's process maturity. We sometimes characterize an organization as being at one level or another, but, more commonly, we suggest that a given organization is responsible for a given set of processes and then characterize the maturity with which the organization is handling each of the processes.

## Summary

There is no sense in which what we have described here should be confused with the work of the Software Engineering Institute (SEI). In effect, we have simply borrowed a few terms and the concept of levels from CMM, and interpreted them very informally. We believe that most large organizations should investigate a formal CMM approach.

What we have proposed here, however, is a different kind of beast – it's an informal system that a business process manager could use to evaluate groups within his or her own company. It's not a formal evaluation methodology at all, but, rather, an informal approach and a set of heuristics you can use to quickly characterize your organization's BP maturity.

Organization: XYZ Company's Widget Sales Group

Process	Maturity/Notes	
Lead Gathering Process	Level 1 - Undefined	
Initial Contact Process	Level 2.5 - Not completely defined; Some measures and a management.	
Sales Call Process	Level 3.5 - Defined in detail Well measured. Management vertically integrated.	

#### Figure 7. Portion of Worksheet for Recording the Maturity of Processes.

The goal of such an informal analysis is primarily to get people within an organization thinking about processes. The exercise, however informal, gets people talking, and, hopefully, thinking about how they might improve their organization. Many companies have begun to say that they are process-oriented, most without being very specific. A manager can use the simple maturity measures we have suggested here to start a discussion about just how processoriented a group really is. Once others are engaged in such a discussion, they will probably find many ways to become become more process-oriented.

If you do use this approach, you need to be clear about what you are doing. Explain that it's an informal approach to characterizing business process maturity, and not CMM.

If people at your organization become interested in a more rigorous approach to evaluation, then you should point them to CMM. In the meantime, however, this informal approach to characterizing business process maturity may help you stimulate some good discussions about your internal business process practices.

#### Notes

[1] CMM, CMMI and all the variations constitute an important body of work that any manager concerned with processes should be familiar with. Most of the SEI CMM literature is focused on analyzing and evaluating software processes, but the material can be generalized without too much trouble. Recent books on CMMI have made an effort to generalize and describe process maturity more generically. For an introduction, we recommend:

Mark C. Paulk, et al. *The Capability Maturity Model: Guidelines for Improving the Software Process.* Addison-Wesley, 1995. This is one of the first books on CMM, but it has lots of good introductory stuff.

Dennis M. Ahern, et al. *CMMI Distilled (2nd Ed.)* Addison-Wesley, 2004. This is one of the more recent books that describes the latest integrated CMM approach.

[2] Michael Porter. *Competitive Advantage*. The Free Press, 1985. Source of the key ideas on value chains.

[3] Geary A. Rummler and Alan P. Brache. *Improving Performance (2nd Ed.)* Jossy-Bass, 1995. This book begins Rummer's exploration of process management, but for his recent work you should check his website or take one of his seminars. <u>www.performancedesignlab.com</u>

[4] For more information about SCOR, visit the BPTrends site and search for SCOR, or visit the Supply Chain Council's site. www.supply-chain.com

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