

# Achieve **higher levels** of excellence through the capability maturity model

by Grace L. Duffy

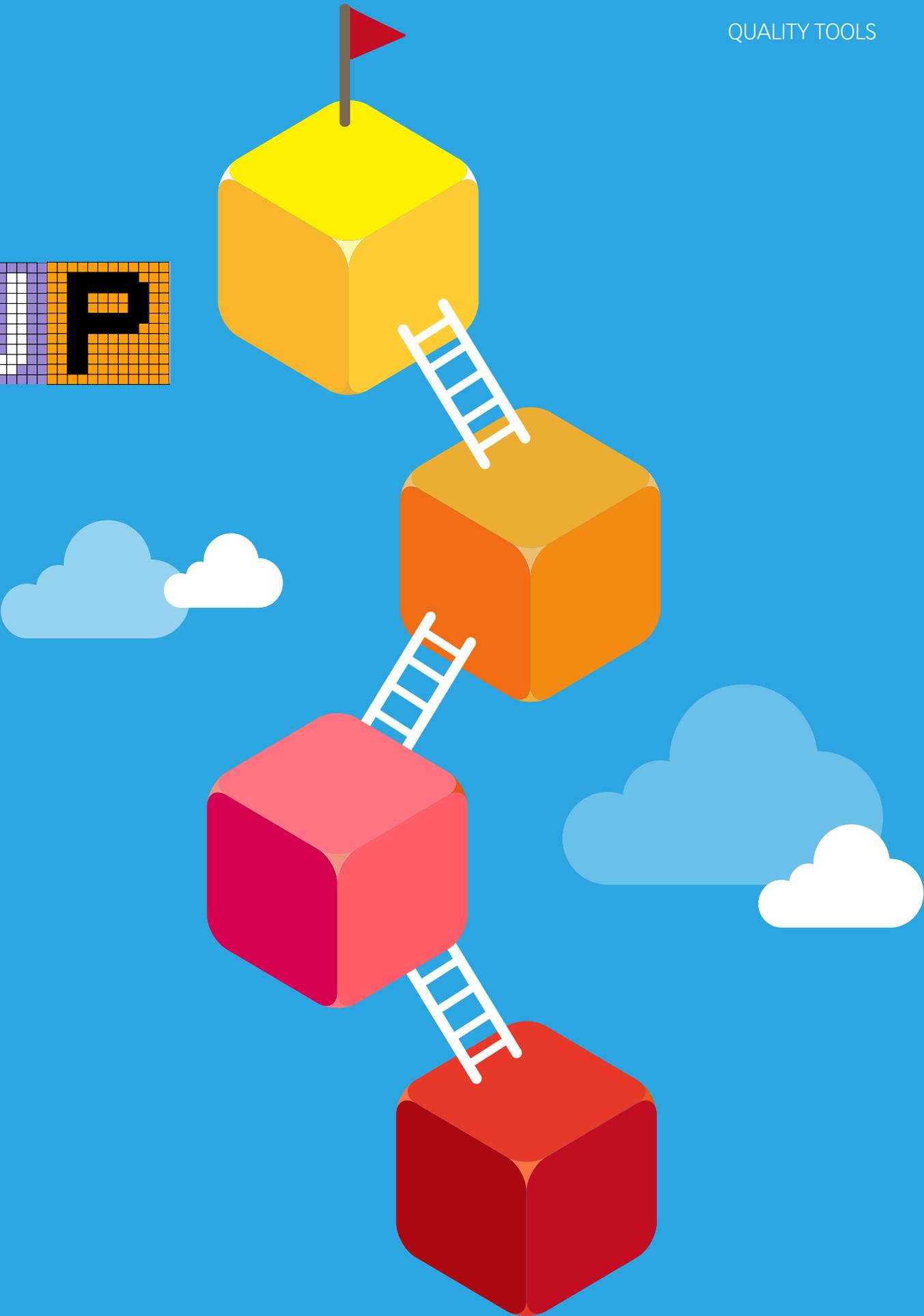
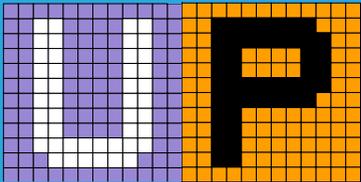
## In 50 Words Or Less

- The capability maturity model describes five performance excellence echelons. Each level includes cultural expectations and supporting quality tools organizations should be using.
- This author offers a roadmap for organizations to progress up the levels and explains how to overcome common challenges along the journey to world-class excellence.

**MODELS ARE CREATED** to help organizations envision how to obtain results. Achieving results requires more than simply designing an approach for improved organizational performance. To be competitive, an organization must have an effective and sustainable execution.

The capability maturity model (CMM) describes how an organization or one of its functions might look during different stages of growth. The CMM can be viewed as a reflection of an organization's culture.

A number of process improvement models align with the CMM—from level-one maturity, with minimal or no processes in place, through level five, a world-class system. At level five, there's an evolving strategy of continuously improved processes and use of quantitative measures.



## CMM

Watts Humphrey's original process maturity framework—and the majority of what are called maturity models—focused on transforming an organizational environment with best practices.<sup>1</sup> CMM started as a roadmap of best practices in software engineering that also were accompanied by best practices in project and organizational management to ensure sustainability.

CMM was a tiered map for enterprise transformation, and today its value is primarily informative and diagnostic. Most CMM models lack guidance on what steps an organization should take to progress up the maturity levels.

Figure 1 illustrates the progression of the five maturity levels and the characteristics of each. By un-

derstanding the difficulty and benefits of achieving a maturity level, an organization can make a conscious decision about which maturity level best supports its current needs. Few organizations make it to level five because it's extremely difficult to achieve and maintain.

A similar model can be applied to better understand a business system's maturity level and help organizations develop action plans based on their current maturity levels and desired future states:

- The maturity of an organization's business environment affects its ability to successfully implement process improvement, regardless of whether it's something incremental or radical.
- Similarly, an effort to improve processes is futile if the basic elements needed to support effective process management are not in place.
- Organizations must implement effective quality and process management systems before any serious improvement initiative is considered.<sup>2</sup>

## Management system maturity model / FIGURE 1

### 5. Best in class

A well-designed method for managing process improvement (incremental and radical change) has been established and the organization has optimized its structure, culture and systems around ongoing change. The organization has demonstrated successful implementation over a sustained period of implementation.

### 4. Managed continuous improvement

Processes are well integrated across the organization, and the relationship of process performance to customer satisfaction and value is well understood. Efforts to improve process performance are an integral part of the organization's business planning and management approach.

### 3. Defined systems approach

Business processes are well-defined, understood and integrated into a systems model of how the business operates, including an enterprise model and process maps.

### 2. Repeatable basic approach

Basic process management controls are established to manage results, and the necessary process discipline is in place to repeat earlier successes. Efforts to improve process performance may be limited, reactive and corrective in nature.

### 1. Initial

Business processes are characterized as ad hoc and occasionally even chaotic. Few processes are defined, and success many times depends largely on individual effort and heroics.

## Making progress

**Level one:** At this phase of maturity, an organization lacks well-defined processes. Someone must initiate the process work, and it's usually in an ad hoc format. A government regulation, for example, might require a new set of reports about particular processes. The effort might be initiated by a senior executive, middle manager or project leader. However it begins, someone starts to use process concepts to make changes in the organization.

**Level two:** This is when an organization usually begins focusing on the documentation and redesign of major core business processes. This effort is usually undertaken by a team that's independent of the people who perform that business process daily.

The project requires a manager who is trained in process design and familiar with the tools and concepts required for a major redesign effort. As a rule, a level-two process redesign project is sponsored by a senior executive or business manager who is strongly associated with the process being redesigned.

**Level three:** An organization moves beyond specific processes and begins to tie all of its processes together to produce value for customers and stakeholders. At this point, the organization generates a business process architecture that provides an overview of major processes that define the organization.

This requires a process architect who is versed in business management because the goal is to achieve a process infrastructure managers can understand. Creating a successful enterprisewide business system requires active participation and support from a team of senior managers and executives over several months or years.

At this stage, an organization usually establishes a center of excellence and a manager who functions as the lead process advocate. This should be a person seriously committed to developing the organization's process maturity. His or her role is often complemented by a senior executive (typically the COO or CIO), who assumes overall responsibility for managing the organization's process efforts.

**Level four:** Organizations will extend the business system with enterprisewide, process measurement systems. They eventually move to process governance systems, which assign managers responsibilities for each major process in the process architecture.

**Level five:** Reaching this level is the most difficult transition. To reach level four, organizations had to move from relying on traditional, functional or departmental perspectives to cross functional and process perspectives. Organizations transitioning to level five must again change their ideas of management and empower employees. Most level-five organizations are organized around employee teams that are responsible for the performance and continuous improvement of specific processes.

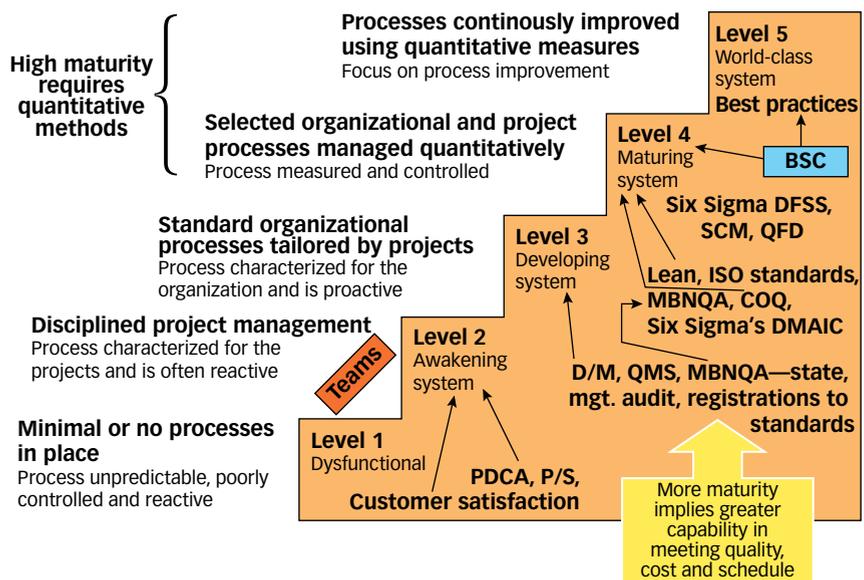
The process manager shifts from being responsible for the process to coaching a team that takes responsibility for the process. At the same time, the organization must adjust employee compensation. This assures employees a significant amount of their compensation is based on the success of the process their teams are responsible for. Obviously, employees cannot assume these roles without training and a significant commitment to the process from executive management.<sup>3</sup>

### CMM and quality tools, methods

Process improvement models used by leaders provide excellent examples of specific steps that can be taken to improve and move up maturity levels. The characteristics of process improvement models—from those using simple tools such as plan-do-check-act (PDCA) cycles to those using more complex methods, such as cost of quality, lean, Six Sigma and best-practice recognition—effectively align with the different levels of maturity described in the CMM. Senior management must select appropriate process improvement models based on an organization's level of maturity and leadership style.

It's important to recognize that organizations start at different levels of maturity when implementing process improvement. It does not make sense to jump from a low level of maturity to a complex and sophisticated approach. This isn't a slight on the intelligence of an organization's senior management, but recognition that some organizations put major efforts into different parts of their businesses, depending on their

## Process improvement models mapped to capability maturity model levels / FIGURE 2



BSC = balanced scorecard  
 DFSS = design for Six Sigma  
 SCM = supply chain management  
 QFD = quality function deployment  
 ISO = International Organization for Standardization  
 Mgt. = management  
 DMAIC = define, measure, analyze, improve and control

MBNQA = Malcolm Baldrige National Quality Award  
 COQ = cost of quality  
 D/M = decision making  
 QMS = quality management system  
 PDCA = plan-do-check-act  
 P/S = problem solving

cultures or customer requirements.

Figure 2 (p. 41) illustrates how to match different process improvement models with CMM levels of organizational maturity.

### Level one to level two

In Figure 2, level one is described as dysfunctional, with minimal or no processes in place. At this stage, an organization might experience unpredictable or unstable processes and is functioning reactively. In this situation, PDCA cycles, problem solving and customer-satisfaction data are appropriate tools that can be applied to an organization's improvement efforts.

**The PDCA cycle:** This flexible, simple approach addresses corrective action in the workplace. This tool encourages observation and planning to identify the root cause of an error, plan a response, pilot a solution, measure results, and document the changes and new process to maintain gains.

**Problem solving:** This also is an appropriate method for addressing an unstable business environment. Fixing what's wrong is a reactive approach that—if lessons are learned and remembered—prompts an organization to learn from mistakes and change its behavior so the error is not repeated. The feedback channel for root cause analysis starts the process of structuring activities for data gathering.

**Customer satisfaction data:** This encourages

prioritizing forward-facing activities that provide immediate gains in areas that count most. Organizations should start by improving their products and services to better meet customer needs, which focuses the organization on core process improvements.

These improvement tools will drive the organization to define and stabilize its processes. This definition of processes leads to the more-disciplined project management stage of level two.

### Level two to three

Level two represents the awakening of the system. An organization begins to focus on a project-based improvement approach, and teams are chartered to respond to crises and corrective actions. The organization is still reactive, but it's better able to constructively gather data.

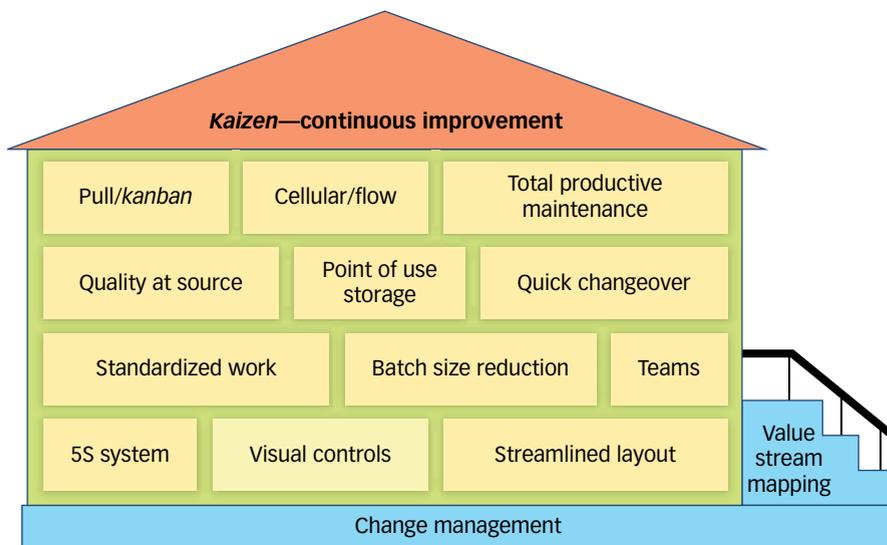
At this level, effective improvement methods include decision making, a rudimentary quality management system (QMS), a state-level Baldrige performance excellence program, management audits, and specific standards or registration requirements.

**Decision making:** This is a step that's more organized than problem solving. With decision making, there is a concerted effort to organize quantitative and qualitative data into patterns from which reliable observations can be made. Rather than reacting to whatever happens, a level-two organization anticipates actions by using those patterns to make assumptions about future events.

**QMS:** This is the process of establishing policies and objectives with regard to quality, and directing and controlling the activities necessary to achieve those objectives.<sup>4</sup> Designing and implementing a rudimentary QMS helps an organization see processes as an integrated whole, which raises its performance to level three—a developing system.

**The Baldrige Performance Excellence Program:** This is another approach to organize processes into an enterprisewide, interdependent whole. Emerging level-two organizations may be too new to a systems approach to meet the challenges of a Malcolm Baldrige National Quality Award review, but the state or local-level competitions are

## The house of lean / FIGURE 3



5S = sort, set in order, shine, standardize and sustain

excellent drivers for improvement.

**Management audits:** These view processes as a system of interacting communication channels. The rigor of preparing for management audits is a defined way to document processes as they affect internal and external hand-offs among activities. The audit function is where all the loose ends are tied together for a smooth flow into the standard organizational processes of level three.

### Level three to four

The CMM's third level is represented as a developing system. Standard organizational processes are tailored by planned projects. Processes are well defined, and the organization is now proactively managing processes to meet identified customer needs. At this level of organizational maturity, more sophisticated process improvement techniques become effective, such as:

- Lean.
- Management standards from the International Organization for Standardization (ISO).
- The Baldrige Criteria for Performance Excellence.
- Cost of quality.
- Define, measure, analyze, improve and control (DMAIC).

Lean seeks to eliminate waste and minimize disruption in the flow of products and services. Figure 3 illustrates the “house of lean,” which shows the tools used to eliminate waste in an organization.

Organizations striving to reach level four have made enough progress to take full advantage of the ISO family of quality management standards. Going through the rigor of initial preparation and auditing for any ISO standard will drive quantitative improvement in an organization's performance and sustainability.

Participating in the national Baldrige Performance Excellence Program helps an organization reach an overall systems perspective. The standardization and stabilization of processes across all functions is what raises the maturity to level three. Tying these processes together with quantitative monitoring and control is what advances an organization to level four.

Another benefit of level three's standardized processes is the ability to gather reliable financial data on their performance. At this level, cost of quality becomes a viable approach for identifying key areas that need improvement.

Processes should be stable enough to support us-

ing Six Sigma tools to assess and reduce variability in product or service outcomes via the DMAIC method. This leads to using quantitative data for problem definition and analysis, which is a level-four characteristic.

### Level four to five

A level-four organization can reliably gather quantitative data on the performance of its projects and processes. The stability of core processes lends itself to more cross-functional improvement techniques, such as supply chain management, quality function deployment (QFD) and design for Six Sigma (DFSS). After the organization is fully aware of the interdependency of complex processes, an effective balanced scorecard also may emerge.

**Supply chain management:** This assumes the individual components of a supply chain are effectively and efficiently controlled. Individual components of the supply chain will have successfully passed through level-three and level-four maturity stages, and functioning quantitative data gathering and analysis techniques are firmly in place.

The transition to level five, or to becoming a world-class excellence system, requires an appreciation of integrating measurements, communication and management processes across multiple suppliers, operations and customers.

**QFD:** This tool identifies external customer needs and translates them into internal technical requirements, processes, procedures and control plans. Using QFD with feedback and lessons learned will, over time, support the sustainability of the highest levels of maturity.

**DFSS:** This requires an organization to have a clear vision of its future, and it should effectively translate that vision into operational reality. Understanding the quantitative and financial impact of operational activities is a prerequisite to performing a risk analysis that's integral to a DFSS project. Only organizations that become world-class systems have truly integrated management systems that allow them to walk the razor's edge of innovation and intense economic competition.

It's rare for an organization to transition into having a world-class system with processes that are continuously improved using quantitative measurements. An organization typically will be recognized as a Baldrige-type award winner by its peers or review teams only to lose focus and retreat back to level-four or

even level-three maturity.

It is tremendously difficult to keep all parts of an organization running at the highest level of performance. Simple changes, such as an economic downturn, senior management turnover or shifting culture, can create a disconnect between different parts of the business and cause an organization to stumble.

### Competing requirements

The CMM describes an organizational progression—more maturity implies greater capability in meeting quality, cost and schedule requirements. To increase the likelihood of success, leaders face several competing requirements, including a need to:

- Gain acceptance of change.
- Maximize individual and team capabilities.
- Align department actions to organizational strategies.
- Allocate a finite resource pool in support of prioritized requirements.
- Have accurate measurement, monitoring and ad-

justment of transformation events.

After these leadership elements coalesce, they provide decision makers with the awareness and understanding necessary for large-scale institutional change.<sup>5</sup> Matching techniques with the ability of an organization is an intuitive approach for successful change management and continuous improvement. **QP**

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