

Building and managing a Quality Center of Excellence



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Abstract

Today, more than ever, the quality of your applications directly impacts your bottom-line business results. This is the reason IT departments of most enterprises invest heavily in products, people, and processes that can maximize application quality.

For individual projects, this meticulous attention to quality usually pays off in an excellent software application. Yet, all too often, limited effort is made to apply the lessons learned and quality management expertise, newly acquired, to multiple projects. The result: Project teams constantly reinvent the wheel, wasting time, money, and IT talent; and businesses perpetually reinvest in applications and create “shelfware.”

One leading solution that has been embraced by key customers and analysts alike is the Quality Center of Excellence (CoE) model. The solution essentially consists of an internal consulting team that acts as a central source of standardized quality management and optimized best practices. A Quality CoE can also provide the entire organization with a central platform for quality asset management that will create visibility into quality parameters of the delivered application, keeping everyone informed and applications aligned with business objectives. Among the advantages of this model are:

- **Efficiency**—The Quality CoE integrates management expertise and tools and makes them conveniently accessible to all project teams through one central source.
- **Consistency**—The Quality CoE standardizes quality best practices that helps ensure consistent, cost-effective, and rapid implementation of optimized quality processes.

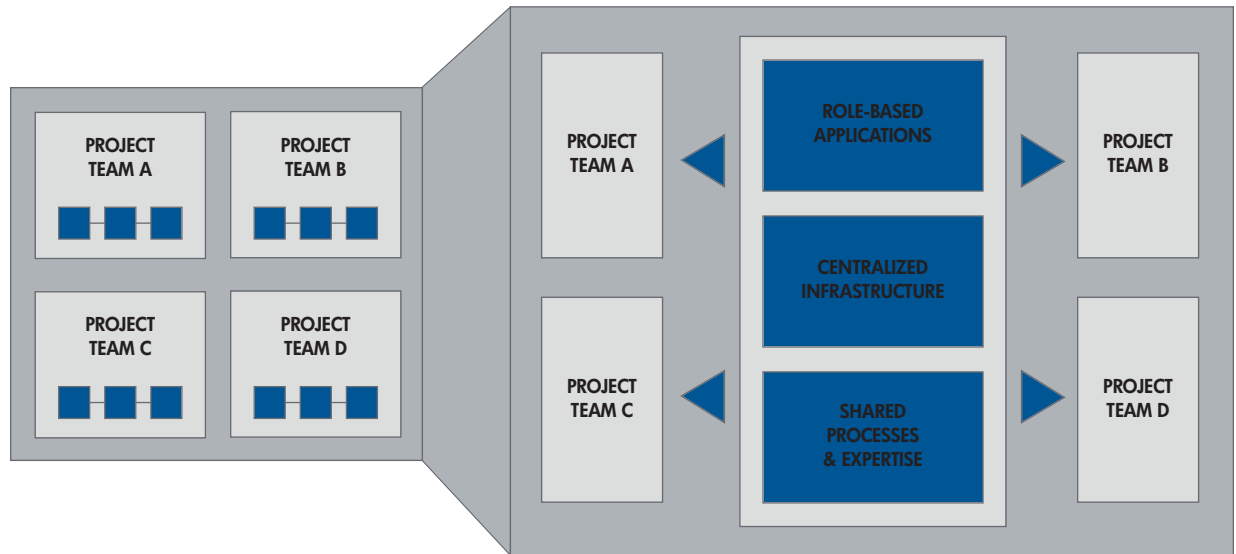
- **Practicality**—The Quality CoE is an achievable goal. You can start on a small scale, leveraging existing resources, and expand its capabilities as the value is proven.
- **Career advancement**—The Quality CoE model creates compelling new career opportunities for IT professionals, helping the organization recruit and retain top talent.

In general, the Quality CoE can improve quality while cutting TCO and enable your best people to contribute to the organization better. As the industry leader in business technology optimization (BTO) products and services, HP Software is uniquely positioned to offer assistance to companies that wish to make the move to the Quality CoE model. This paper summarizes the business value of the CoE model and outlines the process for building and managing a Quality CoE using the HP Quality Center suite of integrated applications. Together, the Quality Center applications provide a management and automation platform that lets you build and manage a Quality CoE with minimal expense, risk, or disruption to current processes.

What is a Quality Center of Excellence (CoE)?

Simply put, a Quality CoE is an internal organization focused exclusively on optimizing the quality of applications. It provides a management and automation platform for quality processes, consulting and support services, and leadership and advocacy to help the organization optimize quality. Through the Quality CoE model, project teams are able to take advantage of all the expertise, toolsets, and best practices the Quality CoE has developed and

In the traditional model, every project team is an island, with its own staff, tools, and practices. The CoE model centralizes the expertise, processes, and sharable assets.



consolidated. This section provides an overview of the Quality CoE and examples of the services it can provide. The next section will take a closer look at the business value of implementing a Quality CoE.

You should transition to the Quality CoE model if you have the following issues:

- Poor quality applications
- Consistently late-to-market and over-budget applications
- Applications with perpetual problems resulting in constant development patching
- Fragmented responsibility for quality management
- Piecemeal, incompatible resources for quality implementation
- Inconsistent quality practices among different project teams
- Inconsistent application of quality practices across application lifecycle stages
- Underutilized expertise in quality tools and techniques
- Low or declining morale among quality managers, QA professionals, and testers

How a Quality CoE works: three simple examples

The following examples contrast how an IT organization might respond to real-world situations with and without a Quality CoE.

Example 1: The CIO notifies IT management that a new application is urgently needed to enable customer service representatives to check inventory levels in real time over the Web.

- **With a Quality CoE:** IT management contacts the Quality CoE practices manager and requests assistance. The Quality CoE manager provides a project manager, solution architect, and domain experts to lead the quality aspects of the project. Their expertise, standardized tools, and best practices help focus and streamline the development and testing processes, leading to a faster deployment time frame and a higher quality application. And by setting up KPIs, the CoE staff provides objective validation that the application meets quality standards and is ready to launch.

- **Without a Quality CoE:** IT management quickly assembles development and quality assurance (QA) teams, pulling individual coders, testers, and QA specialists off their current projects. Each individual has his or her own tools and processes and ideas about best practices. There is risk of misalignment and lack of coordination among the various participants in the project. As a result, the project consumes more time and budget than anticipated—with quality targets often missed.

Example 2: A key employee with many years of functional testing expertise leaves the company unexpectedly at the beginning of a critical project, taking her process expertise and intellectual capital with her.

- **With a Quality CoE:** The company's best practices for software testing are standardized, shared, and rigorously documented, so the departure of a key individual is not a major setback to current projects or project teams.
- **Without a Quality CoE:** IT management must scramble to find another individual within or outside the company with similar expertise.

Example 3: A project testing team wants to purchase a solution to automate functional testing, but is not sure how to determine the ROI or choose the best test automation products.

- **With a Quality CoE:** The team can consult with experts at the center, leveraging their experience to make informed decisions about all aspects of automating the testing process. The CoE team helps to architect an automated test suite and leads the automation, based on best practices. This drastically reduces the project learning curve and automation risks.
- **Without a Quality CoE:** The team must either conduct a time-consuming evaluation of products and processes on its own or hire an external consultant to provide assistance. Automation ramp-up becomes quite expensive and risks associated with the test automation grow.

Quality CoE Maturity model: start small and grow organically

One of the key advantages of the Quality CoE model is that it is achievable and practical. A Quality CoE can be built on a small scale initially, with minimal incremental capital expenditure. As its value is proven to management and IT staff, you can evolve and scale up its resources, services, and capabilities iteratively.

Typically, a Quality CoE addresses critical quality issues and projects in distress, often at the departmental level. In many cases, defect management is an excellent place to start since product defects are both high-profile and expensive. The initial effort could focus on centralizing defect management tools and processes in order to achieve consistency and in standardizing best practices.

As project teams and management begin to recognize the advantages of the Quality CoE model, it can gradually expand its services to broader quality issues. For example, new areas of focus might include test plans management, test execution management, and test automation.

Next, the Quality CoE can evolve from a departmentally-focused service organization to a cross-line-of-business (cross-LoB) resource that provides a centralized, 24/7 testing resource. HP calls this the "Product Utility" model. Leveraging this model, LoBs can increase the ROI of their technology infrastructure by consolidating hardware, software, and maintenance requirements.

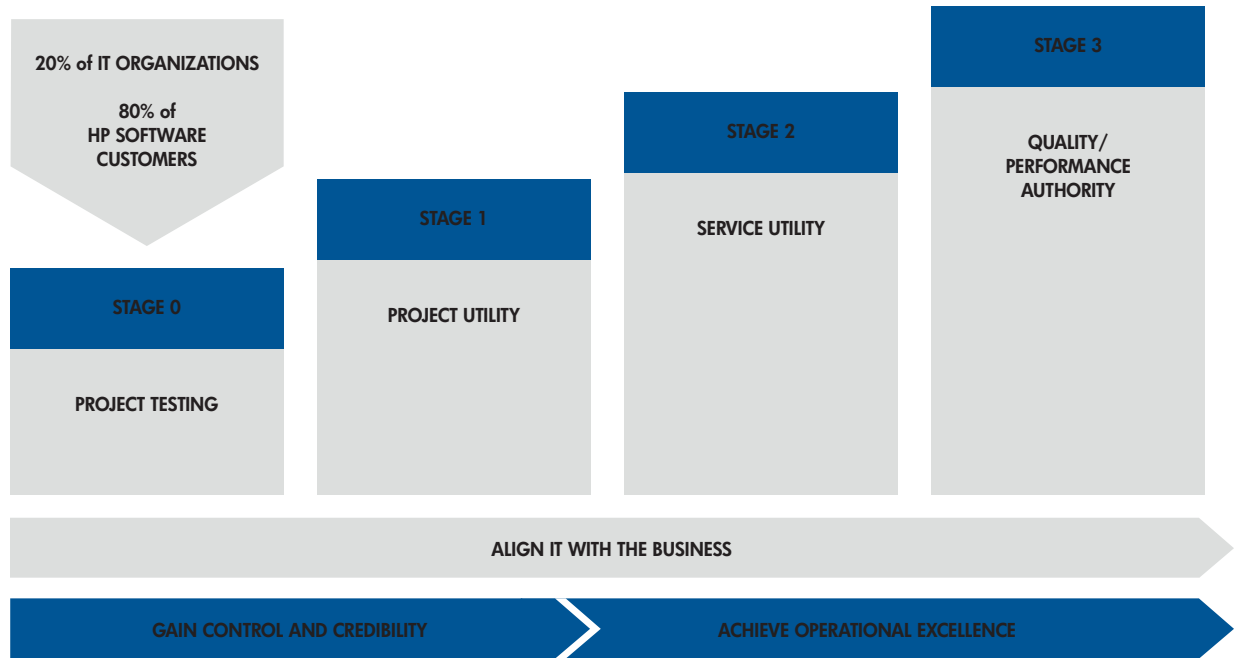
The next step in the evolution is called the "Service Utility" model, in which the Quality CoE becomes a central source of services and expertise for quality-related tasks. Typically, LoBs are limited in their knowledge and use of industry best practices and processes, but with the CoE model they have access to the experience and recommendations of quality experts.

The last step is the transformation of the CoE to a "Quality Authority," in which the Quality CoE becomes a routine part of application development, deployment, and operation, contributing to an organizational culture focused on quality and cost efficiency. Under the Quality Authority model, no application makes it out to production without going through all-encompassing, consistent quality processes. Once established, Quality Authorities can even compete against third-party outsourcers since they have the expertise and track record that no outside vendor or internal LoB can match.

Quality CoE resources and services

Above all, a Quality CoE is a quality management and automation platform. It is the organization's primary means of providing leadership and advocacy for implementing consistent and standardized best practices. It integrates toolsets that result in higher quality and makes these processes and practices easy for the organization to adopt.

The CoE Maturity model features an organic evolution from issue to enterprise.



The specific support services that can be provided by a Quality CoE:

- Build/execute a project testing process:
 - Set up a test strategy
 - Implement quality key performance indicators (KPIs)
 - Implement test management processes
 - Define a test plan
 - Automate test execution
- Optimize existing processes:
 - Determine the ROI of automating functional testing
 - Integrate unit testing/functional testing processes
 - Measure and monitor end-user experience
- Define and implement quality standards:
 - Define quality metrics
 - Implement quality processes
 - Define and implement quality management and automation technologies

To provide these services, the Quality CoE maintains a staff; toolsets, and templates; and documentation of best practices, procedures, and techniques. Staffing levels depend upon the scope and projected growth rate of the Quality CoE. They can range from a

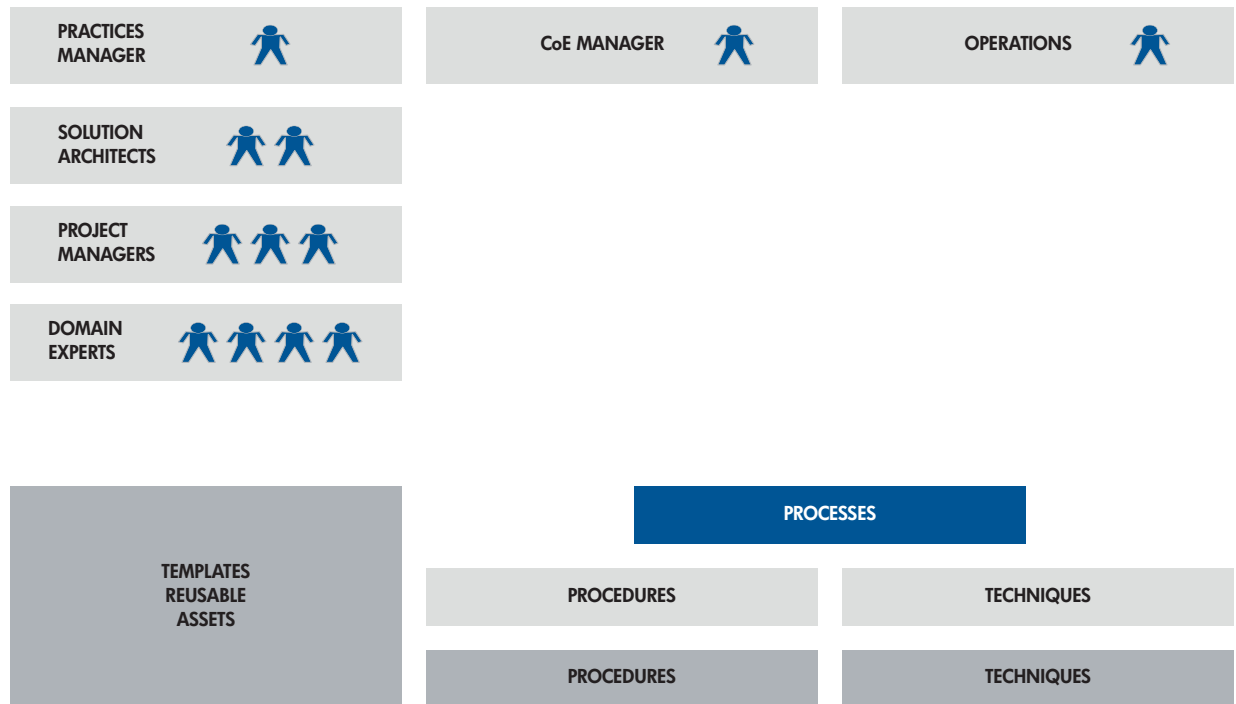
manager and domain expert in the beginning to a dedicated practices manager, CoE manager, and operations manager, along with solution architects, project managers, and domain experts.

Common Quality CoE Key Performance Indicators (KPIs)

In addition to providing consistent processes, industry best practices, and toolsets for higher quality, the CoE model also provides a dashboard of Key Performance Indicators (KPIs)—measurements of specific quality-related criteria. By maintaining and regularly monitoring KPIs, organizations can help keep everyone informed and align their IT and business goals. Examples of typical KPIs include:

- CoE management level:
 - Number of customers
 - Number of requests for service
 - Total number of projects
 - Number of references
 - Revenues
 - Gross margins

Shown are the examples of typical Quality CoE resources and assets.



- Project management level:
 - Effort variance
 - Schedule variance
 - Customer satisfaction rating
- Test project level:
 - High severity defects
 - Requirements coverage
 - Requirements satisfied
 - Defects by area
 - Defects removal rate
- Productivity:
 - Manual test scripts development per person per day
 - Automated test scripts development per person per day
 - Tests executed per person per day

Why adopt the Quality CoE model?

The Centers of Excellence trend has gained traction recently within the IT departments of large

organizations. In fact, the META Group refers to the model as “the next step in IT’s evolution” (Source: The Application Center of Excellence, META Group, 2003). This section summarizes costs, risks, and various limitations of traditional quality management practices and contrasts them with the Quality CoE model.

Problems with traditional quality management practices

- **Piecemeal quality practices and toolsets:** In many cases, each project team develops its own processes, using whatever tools happen to be favored by individual team members. The result is random workflows, practices, tools, and techniques that are not well documented, not well integrated, and not transferable to other groups. The issue is more than inefficiency. The piecemeal approach significantly increases the cost and complexity of quality practices and has the potential to diminish morale and limit skill development of IT staff.
- **Excessive use of manual processes:** Many IT departments are aware that there is a tremendous opportunity to cut costs and increase productivity by automating certain aspects of the QA process, such as functional testing. Yet at many companies these and

other processes are still performed manually. The result is an inability to meet ever-tighter release schedules, test thoroughly and reliably, and verify that business processes are functioning correctly. Ultimately, this limits the company's ability to generate higher revenue and improve customer satisfaction.

- **Disconnected quality processes:** Different silos of the development and delivery process use their own approach to quality. This results in miscommunication, misalignment, and, ultimately, lower quality.
- **Lack of alignment between quality practices and business goals:** With the piecemeal approach to quality management, individual project teams are often several layers removed from IT or executive management and can find it difficult to focus on the overarching business objectives of their projects.

The Business Value of the Quality CoE Model

- **Lower costs, higher revenues:** The efficiency of the Quality CoE model helps cut costs and waste while improving application quality and business responsiveness, resulting in competitive advantages that drive revenue.
- **Higher profits:** The Quality CoE model delivers better application software, faster deployment of new software-driven services, reduced risk of expenses related to defective software, and the ability to react more quickly to changing market conditions. This results in more satisfied end users and, ultimately, increased competitiveness and profitability.
- **Decreased time-to-market:** The rapid response capability of the Quality CoE helps reduce total project time, resulting in faster time-to-market and

on-time response to business needs—all at a lower total cost.

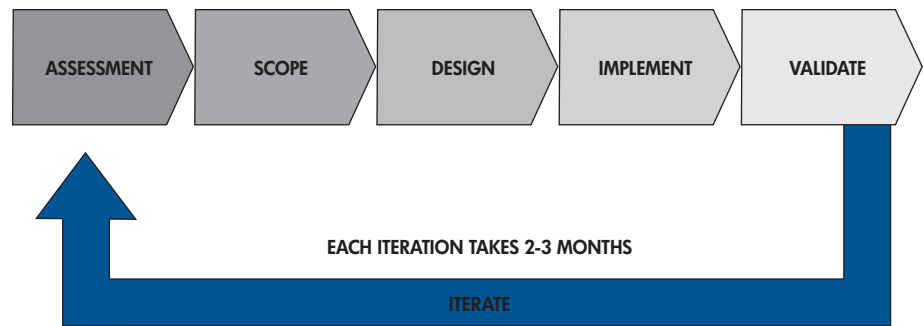
- **Greater flexibility:** Organizations can implement a Quality CoE on a small scale, leveraging existing resources, and then expand its capabilities as the value is proven.
- **Tighter alignment:** The Quality CoE helps keep the application aligned tightly with business needs by defining and measuring KPIs.
- **Career advancement:** The Quality CoE model creates a compelling new career opportunity for IT professionals, leading to better human resources and helping the organization recruit and retain top talent.
- **Culture of quality:** The transition from islands of expertise to standardized quality processes and toolsets helps the organization focus on quality issues and speeds the evolution to a culture of quality.

How to build a Quality CoE

No two organizations have the same requirements, resources, or starting point for building a Quality CoE. However, the flexibility of the CoE model enables companies to start small, using existing resources, and achieve tangible benefits almost immediately.

This section outlines the typical process for building a Quality CoE step by step. A detailed discussion of each step and specific best practice recommendations are available through HP Managed Software Solutions.

The HP Managed Software Solutions team provides assistance in architecture, planning, actual implementation, and even operation of organizational, process, and technology aspects of a Quality CoE.



Assessment

The first step in building a Quality CoE is identifying the business goal. This is accomplished by answering two questions honestly—what is the biggest pain point right now, and what issues really need to be addressed immediately? These answers will help you determine the focus and scope, and how success will be measured.

Once the business goals have been identified, the assessment phase evaluates the organization's readiness to build a Quality CoE and accomplish the business goals identified in the previous step. It also provides an objective rating of the Quality CoE's value to the organization in terms of expected ROI.

A critical step that occurs in the assessment phase is the alignment of the company's business goals with the specific quality goals of the IT organization. With an understanding of how these goals impact each other, IT management can begin to identify a set of quantifiable metrics—key performance indicators (KPIs)—that measure the accomplishment of the business goals. Examples would include an application quality index factoring variables such as number of defects, impact of the defects, closure rates, and production faults. Or it could be a business process quality index measuring the number of transaction error versus the overall number of executed transactions associated with a business process. These indicators not only define measurable Quality CoE success criteria; they also form the basis for determining the economic value of the Quality CoE. For example, they can show how an increase in the application quality index directly decreases customer service costs.

The assessment stage also provides the tools for modeling the resources—hardware, software, and people—required to support the Quality CoE. In this phase, the organization creates a strategy for organizational change and builds a roadmap for achieving that change. It also selects the services it requires to help institutionalize change.

In addition, the assessment consolidates the process of:

- Designing the organizational structure of the Quality CoE
- Outlining the organizational impacts of building a Quality CoE
- Estimating the required hardware, software, and human resources needed
- Determining the high-level milestones and timelines
- Calculating the expected value from the Quality CoE in terms of cost savings and quality improvements

Scope

In this phase, the organization determines the focus of the Quality CoE and defines the exact content of specific implementation iteration. For example, it could choose to focus the Quality CoE on one particular stage of the application lifecycle, such as integration or user acceptance testing – and implement the technology and resources needed to support that stage. Or it could focus on a particular activity, such as automating functional testing. Or it could choose to focus on the needs of a particular business unit and prototype the Quality CoE for that unit as a pilot that can later be rolled out to other areas of the company.

Design

The design step focuses on detailed planning to meet the scope as defined in the previous stage. At this stage, the outlines of the roadmap prepared in the assessment phase are fleshed out through a detailed iterative plan synchronizing the activities of all players.

The first step is to assemble a cross-functional team chartered with identifying the process and organizational impacts of the Quality CoE, defining roles, and detailing available resources. Once a broad-brush implementation roadmap has been developed, the team builds a detailed iterative plan synchronizing the activities of all players involved. All of the organizational and process changes are detailed and planned. Change management specialists may be called on to play a role in specifying how to plan and implement the process changes.

The design plan, detailing the CoE architecture and the implementation plan, is constructed across:

- **Integration:** How the CoE interfaces with projects, management, service providers, and other quality initiatives
- **Staff:** Hiring and internal reassignment
- **Training:** Instruction on HP Software solutions, third-party software, and policies and procedures
- **Infrastructure implementation:** Acquisition and installation of hardware and software, service provisioning
- **Communications:** Internal communications explaining and promoting the CoE
- **Methodology development:** policies, procedures, processes, and best practices for implementing business technology optimization (BTO)
- **Time and cost estimation:** Approximation of time and money required

Implementation

Implementation deals with the setup of specific Quality CoE services. Your organization may have the resources in place to address implementation issues or it may prefer to enlist the assistance of HP Managed Software Solutions—we have helped thousands of companies with this stage over the years.

During the actual implementation stage, resources are assigned; the tools and environment are set up, the team receives any required training; process and organizational changes are applied, and the Quality CoE services are marketed within the company.

As the Quality CoE actually begins its operations, quality-related projects are identified and Quality CoE resources and services are delivered according to the defined methodology and processes. As part of this stage, the Quality CoE will:

- Monitor and report the KPIs created by CoE services and measure the success of the CoE against the metrics established during the planning phase (as stated earlier, these reports go up to senior management and down/across to project teams).
- Provide user support, communicating with and educating end users about the services offered, processes and procedures to be followed, and how to measure the value created.
- Maintain and enhance the hardware, software, and services infrastructure as required.

Validation

As the results of ongoing management accrue and validate the successes or required improvements, the Quality CoE uses the information as the basis for ongoing iterations. Validation is an essential step in managing the Quality CoE implementation and growth, based on the value-driven goals. In the validation stage, the measurable objectives set forth during the assessment phase are compared against actual achievements. In this stage, implementation experience is also summarized to ensure that it is preserved in the best practices and methodology.

Iteration

Once an organization experiences the value of the Quality CoE model through one iteration, it can proceed to the next one—either expanding a service that already exists, implementing another type of capability, or extending service coverage to new parts of the organization.

In many cases, there are some centralization activities in various areas of the company already—for example, a CoE focused on test automation or defect management. If this is the case, it may make sense to formalize the activities and processes between the individual centers as their capabilities grow.

Another approach is to start by using the Quality CoE model to resolve one specific critical issue (e.g. frequently failing deployed changes), then:

- Gradually build up the resources and capabilities of the CoE to optimize quality processes and techniques on a project basis (pre-empt quality issues through consistent test management process).

- Extend the CoE model to other areas such as test requirements management, detailed test planning, test automation, etc.
- Ramp up to standardized processes and solutions throughout the enterprise.

HP quality center: an integrated solution

Quality Center provides an excellent foundation on which to build a complete, efficient Quality CoE. It provides an integrated set of applications designed to automate key quality activities, including quality management, functional testing, and business process testing, including:

- **HP TestDirector for Quality Center software:** The industry's first global test management solution helps organizations deploy high-quality applications more quickly and effectively. Its modules—HP Service Test Management, Release Management, Requirements Management, Test Plan, Test Lab, and Defects Management—are seamlessly integrated, allowing for a smooth information flow between various testing stages. The completely web-enabled solution supports high levels of communication and collaboration among distributed testing teams, driving a more effective, efficient global application-testing process.
- **Functional Testing Automation:** With 16 years of experience testing our own products, automating our testing, and listening to our customers—and a 61 percent market share for automated testing products (Source: IDC 2006, Worldwide Distributed Automated Software Quality Tools 2006 - 2010 Forecast and 2005 Vendor Shares)—HP Software is

the market-leading source of functional testing products and guidance. Key testing and test automation product lines include the industry's best solution for functional and regression test automation, and an integrated, functional testing product for the entire enterprise.

- **HP-Managed software solutions:** HP consultants install, configure, and integrate the appropriate Quality Center applications and modules. HP best practices are then adapted for your environment and a set of tailored, documented processes is created. Finally, the consultants transfer their knowledge of optimal center operation to your people.

Answers to CIO questions about the CoE Model

Q: How do I ensure quick results?

A: Use the iterative approach (approximately Two to three months per iteration). Focus on services that will generate quick results, such as defect management.

Q: What level of investment will be required?

A: Depending on the maturity of your organization, you may be able to start your Quality CoE with two people and one technology component of the CoE automation platform.

Q: How do I ensure adoption of the CoE concept?

A: Find a project team that is open to the idea, find success stories that address a need of this project, and use your own success story to market the value on completion of the project.

Q: How do I prevent disruptions to the organization's daily operation?

A: The initial focus on critical issues will align CoE services with daily operations easily. At the same time, the CoE should be flexible enough to support specific project requirements and culture before it is used as the foundation for standardizing enterprise processes.

Q: How do I use the CoE model to compete with alternative service providers?

A: First ensure that you are easy to do business with—faster and cheaper. Then ensure that your processes are better and your quality is higher.

Q: How do I demonstrate value of the CoE?

A: It is essential to measure CoE impact on the projects and CoE effectiveness. Some KPIs can include project improvement—response time improvement, reliability improvement, infrastructure reduction—as well as CoE efficiency—projects per person, project time, cost of project, etc.

Summary: 10 tips for building and managing a Quality CoE

1. The earlier you plug into development and delivery processes, the easier it is to deliver value to your internal customers.
2. The fastest path to success is to begin with defect management. It is very easy to show value practically from the first projects.

3. Internal selling is essential. It is not enough to be the best technical team. You need to communicate and prove your value to your organization.
4. You need to define your value proposition to compete for projects where alternative providers may be under consideration. The emphasis in early projects will be the cost and speed of your services.
5. Your organization might be unaware of all the capabilities and value of quality optimization and management. Educate your organization, evangelize IT management, organize workshops for the decision makers.
6. Robust infrastructure and automation platforms are essential for the success of the Quality CoE. Simply having good processes will not prove that you do the job better than any other internal and external competitor.
7. Knowledge accumulation is critical for services such as regression testing and test automation. You will need to ensure that every member of the CoE reports all the findings in these areas.
8. Ensure that you measure your achievements. This is important for controlling the value of the CoE and also proving your value to the outside world.
9. You need to provide your customers with high visibility into your progress, status, and findings. Lack of information drives customer dissatisfaction.
10. While your goal is to standardize processes and practices to ensure lowest cost and the highest efficiency, you need to be "easy to do business with." This means flexibility to adapt your approach and capabilities according to the customer's project framework and, even, culture.

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