Building and managing a Performance Center of Excellence

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Abstract

The increasing focus on application performance is rooted in a key fact—No matter how well applications are designed, no matter how well they meet business requirements, they are virtually useless to end users if performance is sluggish or unreliable.

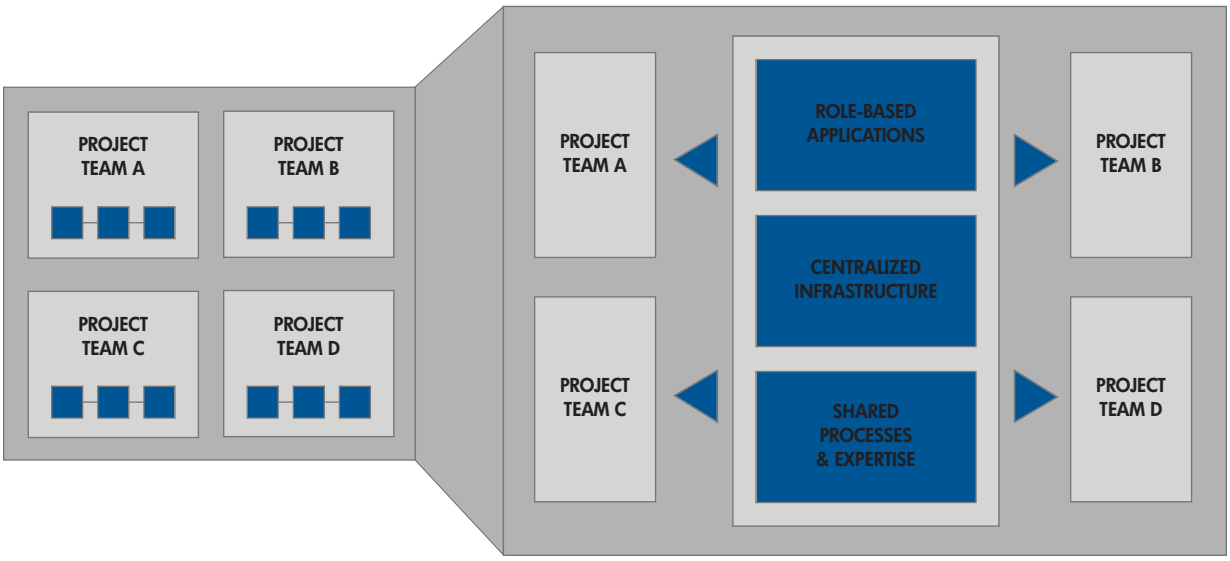
Enhancing the speed and availability of applications can be complex, and often requires expertise that takes time to develop. At the same time, every phase of application performance optimization has become specialized due to greater complexity of platforms like SOA, Virtualization, Web 2.0 and other IT trends, which come with their own specific skill sets, tools, formats, protocols, and processes. Load testing, Code optimization, Usage analysis, Tuning, Capacity planning—the problem is that very often, the skills developed and processes created by individual project teams are not shared within the IT department or across lines of business. This results in each team starting from scratch with each new performance optimization project—wasting time, money, and talent.

One leading solution that has been embraced by key customers and analysts alike is the Performance Center of Excellence (CoE) model—essentially an internal competency center that acts as a hub of performance optimization expertise. A Performance CoE does away with disparate tool usage and inefficient performance testing that may result in inaccurate analysis. A Performance CoE can also provide the entire organization with a central platform for performance management that will create visibility into critical performance parameters of the delivered application, keeping everyone informed and keeping applications aligned with business objectives. Following are the advantages of this model:

- Centralized infrastructure and expertise: Test labs, tools, staff, and best practices are integrated and conveniently accessible to all project teams through one source, eliminating the need to replicate expensive resources (in fact, total headcount could be reduced).
- Faster, better processes: Standardizing toolsets and processes helps enable consistent, cost-effective, and rapid implementation of enhanced processes.
- Practical and achievable: Building a Performance CoE is an achievable goal. You can start small, leveraging existing resources, and expand as the value is proven.
- Business focus: The Performance CoE model measures performance from the perspective of business and end-user results, not just systems or components.

In general, the Performance CoE can improve performance and availability while cutting total cost of ownership (TCO), and can help ensure that your best people contribute to the organization. HP is uniquely positioned to help your company transition to the Performance CoE model. This paper summarizes the business value of the CoE model and outlines the process for building and managing a Performance CoE using the HP Performance Center suite of integrated applications. It also provides real-world examples of companies that have experienced the benefits of the CoE model.

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.



What is a Performance CoE?

A Performance CoE is an internal competency center focused on enhancing and validating the performance of applications to meet business requirements. It provides a management and automation platform for performance optimization processes, as well as consulting services, support services, and leadership and advocacy to help the organization understand the importance of performance validation and optimization and the CoE model.

Through the Performance CoE, project teams are able to take advantage of all the expertise, toolsets and best practices the CoE has developed. This section provides an overview of the function of the Performance CoE and examples of the services it can provide. The next section takes a closer look at the business value of implementing a Performance CoE.

Checklist: You Should Transition to the Performance CoE Model Soon, if you have

- Applications with notably sluggish performance
- Applications that experience poor and/or deteriorating performance when there are spikes in end-user demand
- Fragmented responsibility for performance optimization
- Inconsistent performance optimization practices among different project teams
- Inconsistent performance optimization practices across application lifecycle stages
- Underutilized expertise in performance optimization tools and techniques
- Low or declining morale among performance testing and tuning personnel
- Lack of performance testing infrastructure
- Too much shelfware

How a performance CoE works: four simple examples

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

Example 1: The CIO notifies IT management that employees have been complaining about the performance of a recently deployed HR application.

- **With a Performance CoE:** IT management contacts the Performance CoE Practices Manager and requests immediate resolution of the problem. The manager then provides a performance test specialist, a performance tuning specialist, and a workload

analyst to find and fix the root problem. Their expertise, standardized tools, and best practices help expedite the diagnosis and the problem is quickly solved.

- Without a Performance CoE: An operations team, consisting of various experts focusing on specific silos and using disparate tools, start to assess the problem. The problem passes on from specialist to specialist, and all analysis happens retroactively on the live system, which means a lot of assumptions are involved. The net result is that addressing the performance issue takes longer than expected, while other critical projects and languishing end users still suffer.

Example 2: Marketing team is launching a new campaign that will result in additional load on the Web site, and IT wants to know if the site can handle the overload.

- **With a Performance CoE:** The IT department can prepare for the campaign by validating the available capacity of the system and building an efficient capacity management plan.
- **Without a Performance CoE:** The campaign may be launched despite inadequate system planning and preparation, resulting in wasted marketing spending, missed sales opportunities, and disgruntled customers.

Example 3: A project team finds that performance of a newly developed J2EE application bogs down unexpectedly under heavy workloads and cannot determine the cause.

- **With a Performance CoE:** The team can consult with experts at the center, leveraging their experience in identifying other possible causes of the performance problems. The CoE team introduces them to J2EE Deep Diagnostics Technology, which finds the root problem and allows for a quick resolution.
- **Without a Performance CoE:** The team must either conduct a time-consuming evaluation of diagnostic products and processes on its own (often involving a lot of assumptions and trial-and-error), or hire an external consultant to provide assistance.

Example 4: An employee with a stellar reputation as a performance tuning wizard leaves the company unexpectedly, taking his process expertise and intellectual capital with him.

- **With a Performance CoE:** The company's best practices for testing and tuning 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 Performance CoE:** IT management must scramble to find another individual within or outside the company with similar expertise.

Performance CoE maturity model: start small and grow organically

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

Typically, a Performance CoE addresses critical performance issues, projects in distress, or obvious cost-cutting opportunities at first, often at the departmental level. For example, the Performance CoE can initially serve as a catalyst for consolidating the software and hardware used for performance testing, resulting in cost savings through better asset utilization and lower administration/maintenance costs. As project teams and management begin to recognize the advantages of the Performance CoE model, the CoE can gradually expand its services to broader performance issues.

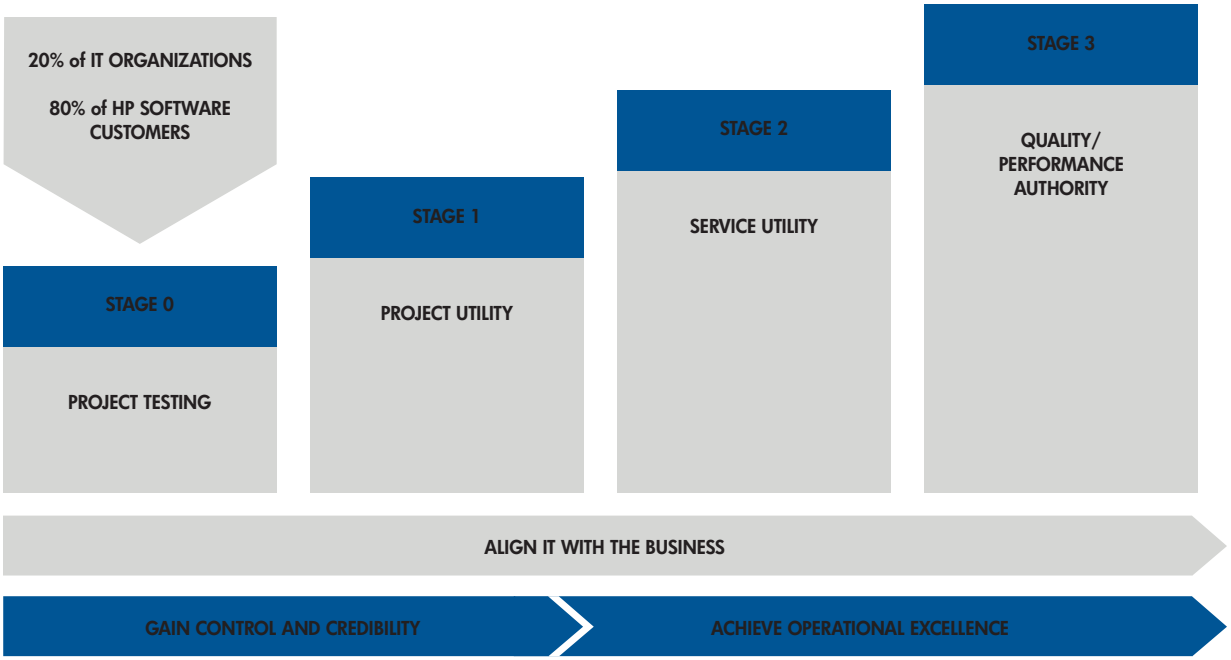
Next, the Performance CoE can evolve from a departmentally focused service organization to a crossline-of-business (cross-LOB) resource that essentially manages the infrastructure and supports the users. HP calls this the "Product Utility" model.

The next step in the evolution is called the "Service Utility" model, in which the Performance CoE team begins to provide actual performance testing services including planning, scripting, and execution of tests.

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 performance experts.

The last step is the transformation of the CoE to a "Performance Authority," in which the Performance CoE becomes a routine part of application development, deployment, and operation, contributing to an organizational culture focused on performance and cost efficiency. Under the Performance Authority model, no application makes it out to production without going through all-encompassing, consistent processes focused on enhancing performance.

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



Performance CoE resources and services

Specific support services provided by a Performance CoE include:

- Performance benchmarking
- Performance testing
- Capacity planning
- Infrastructure optimization
- Problem diagnostics

To provide these services, the Performance 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 Performance CoE, and 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.

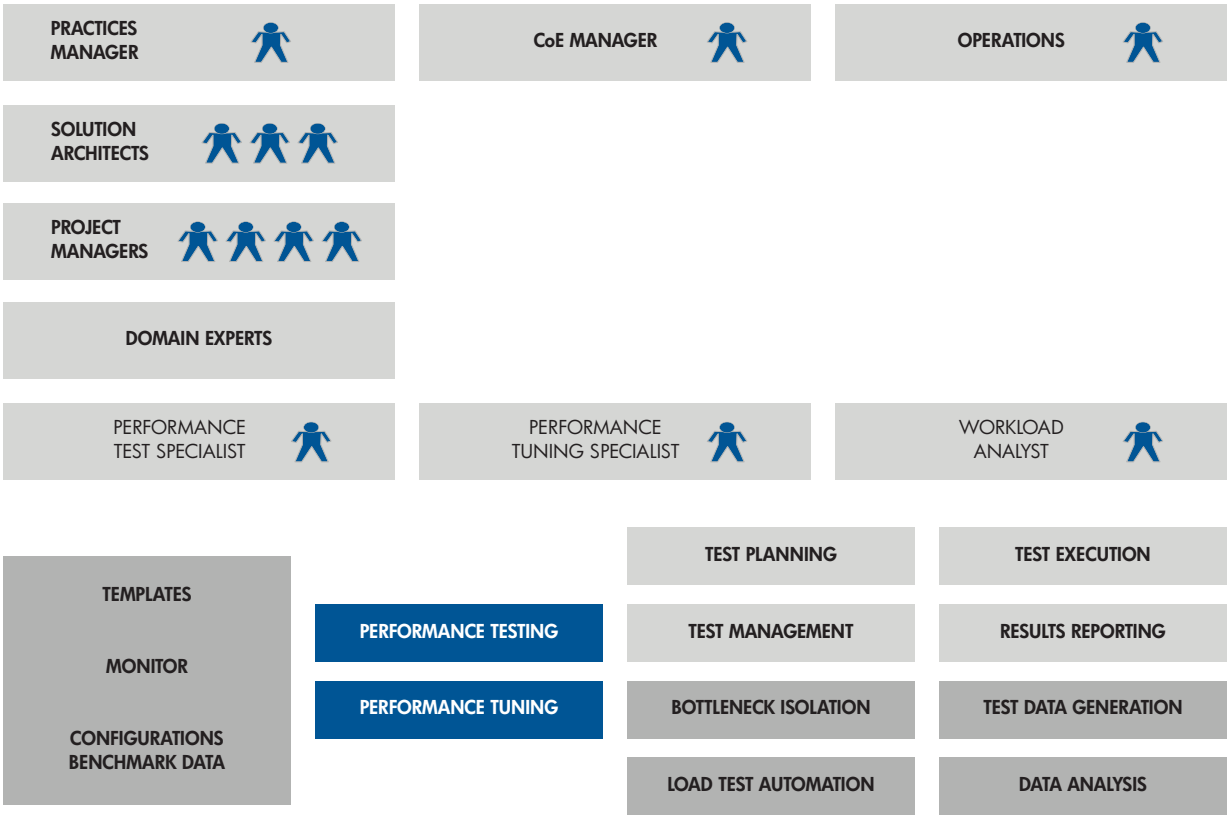
Common Performance CoE Key Performance Indicators (KPIs)

In addition to providing consistent processes, industry best practices, and toolsets for higher performance, the CoE model also provides a dashboard of Key Performance Indicators (KPIs), which are measurements of specific performance-related criteria. By maintaining and regularly monitoring KPIs, organizations can help keep everyone informed and keep IT and business goals aligned.

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 Performance CoE resources and assets.



- Project management level:
  - Effort variance
  - Schedule variance
  - Customer satisfaction rating
- Performance project level:
  - Transaction response time versus Services Level Agreement (SLA)
  - Transactions per second versus SLA
  - Transaction error rate versus SLA
  - System utilization versus goals
  - Business requirements coverage
  - High severity defects
- Productivity:
  - Test scripts per person per day
  - Validation and optimization runs per person per day
  - End-to-end performance validation/optimization projects per person per month

Why adopt the Performance 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 performance optimization practices and contrasts them with the Performance CoE model.

Problems with traditional performance optimization practices

- Piecemeal practices and toolsets: In many cases, each project team develops its own performance optimization processes, using whatever tools happen to be favored by individual team members. The result is a hodgepodge of workflows, practices, tools, and techniques that are neither well documented, nor well integrated, nor transferable to other groups. The issue is more than inefficiency. The

piecemeal approach significantly increases the cost and complexity of practices and has the potential to diminish morale and limit the skill development of IT staff.

- Disconnected processes: Different silos of the development and delivery process use their own approach to performance optimization, resulting in miscommunication, misalignment, and ultimately sub-optimal performance.
- Lack of alignment between practices and business goals: With the piecemeal approach to performance optimization, 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.
- Limited scope of performance optimization: Many companies benchmark their systems late in the development process if at all. As a result, systems are deployed in sub-optimal configurations that still contain undiscovered performance and availability issues—and the disparate toolsets used to enhance performance do not work together.

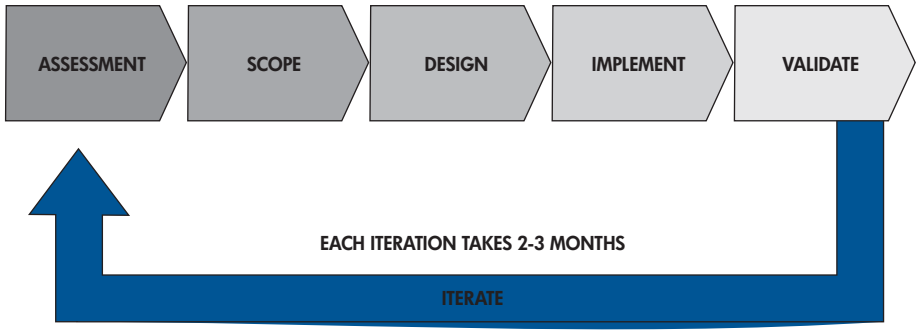
The business value of the Performance CoE model

- Lower costs, higher revenues: The efficiency of the Performance CoE model helps cut the cost of test lab infrastructure and operations while improving application performance, resulting in more satisfied end users and competitive advantages that drive revenue.
- Higher profits: The Performance CoE model delivers better application software, more satisfied end users, faster deployment of high-performance software-driven services, and, ultimately, increased competitiveness and profitability.
- Improved business productivity: Higher application performance typically yields higher end-user productivity. For example, the productivity of a clerk entering orders into an SAP system depends on the response efficiency of the system.
- Decreased time to market: The rapid response capability of the Performance CoE helps reduce total project time, resulting in faster time-to-market of high-performance applications and on-time response to business needs—all at a lower total cost.
- Greater flexibility: Organizations can implement a Performance CoE on a small scale, leveraging existing resources, and expand its capabilities as the value is proven.
- Tighter alignment: By defining and measuring Key Performance Indicators (KPIs), the Performance CoE helps keep the application performance aligned tightly with business needs.
- Career advancement: The Performance CoE model creates a compelling new career opportunity for IT professionals, leading to better HR, and helping the organization recruit and retain top talent.

How to build a Performance CoE

The flexibility of the Performance CoE model enables companies to start small, use existing resources, and achieve tangible benefits almost immediately. This section outlines the typical process for building a Performance CoE step by step. A detailed discussion of each step and specific best practice recommendations are available through HP Services. HP Services provides

Shown are the key steps in building a Performance CoE.



assistance in architecture, planning and implementation, and even operation of organizational, process, and technology aspects of the Performance CoE.

Assessment

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

Once the business goals have been identified, an assessment phase evaluates the organization's readiness to build a Performance CoE and accomplish the business goals identified in the previous step. It also provides an objective rating of the value of the Performance CoE 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 application performance 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. These metrics not only define measurable Performance CoE success criteria; they also form the basis for determining the economic value of the Performance CoE. For example, they can show how an increase in application performance directly decreases customer service costs.

The assessment stage also provides the tools for modeling the resources—hardware, software, and people—required to support the Performance 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 Performance CoE
- Outlining the organizational impacts of building a Performance CoE
- Specifying the required hardware, software, and human resources needed
- Determining the high-level milestones and timelines
- Calculating the expected value from the Performance CoE in terms of cost savings and process improvements

Scope

In this phase, the organization determines the focus of the Performance CoE and defines the exact content of specific implementation iteration. For example, it could choose to focus the Performance CoE on one particular stage of the application lifecycle, such as application development—and implement the technology and resources needed to support that stage. Or it could focus on a particular activity, such as capacity planning. Or it could choose to focus on the needs of a particular business unit and prototype the Performance 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 the 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 created 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 Performance CoE, defining roles, and detailing available resources. Once an initial 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 performance-related and/or quality initiatives
- Staff: Hiring and internal reassignment
- Training: On HP products, third-party software, and policies and procedures
- Infrastructure implementation: 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 estimates

Implement

Implementation deals with the setup of specific Performance CoE services. An organization may have the resources in place to address implementation issues, or it may prefer to enlist the assistance of HP Services which has 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 the required training; process and organizational changes are applied; and the Performance CoE services are marketed within the company.

As the Performance CoE actually begins its operations, performance-related projects are identified and Performance CoE resources and services are delivered according to the defined methodology and processes.

As part of this stage, the Performance CoE:

- Monitors and reports the value created by Performance CoE services and measures the success of the Performance 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).
- Provides user support, communicates with and educates end users about the services offered, processes and procedures to be followed, and how to measure the value created.
- Maintains and enhances the hardware, software, and services infrastructure as required.

Validate

As the results of ongoing management accrue and validate the successes or required improvements, the Performance CoE uses the information as the basis for ongoing iterations.

Validation is an essential step in managing the Performance 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 enable that it is preserved in the best practices and methodology.

Iterate

Once an organization experiences the value of the Performance 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 Performance CoE focused on performance validation or defect management. If this is the case, it is advised to formalize the activities and processes between the individual centers as their capabilities grow.

Another approach is to start by using the Performance CoE model to resolve one specific critical issue (for example, sub-optimal J2EE application performance), then:

- Gradually build up the resources and capabilities of the Performance CoE to performance optimization processes and techniques on a project basis (pre-

empt performance issues through process consistency).

- Extend the Performance CoE model to other areas such as capacity planning, code optimization, etc.
- Ramp up to standardized processes and solutions throughout the enterprise.

HP Performance center: an integrated solution

HP Performance Center offers the first lifecycle approach to optimizing application performance. It includes an integrated set of applications designed to automate key performance optimization processes, such as testing and tuning, bottleneck identification, capacity planning, and diagnostics, including:

- HP LoadRunner software: LoadRunner generates consistent, measurable, and repeatable load tests from a single point of control. It allows you to replace real users with thousands of virtual users, and it isolates performance bottlenecks across all tiers and layers.
- HP Diagnostics software: Technology-specific products that dive all the way down to the code level to resolve issues in J2EE, .NET, Oracle, PeopleSoft, SAP, Siebel, etc.
- HP Center Management for Performance Center software: Provides the ability to manage projects from conception to completion. Also enables scheduling of the projects and the employee assets to the projects. Has a high level dashboard that managers and above can use to follow the status of the projects.

Top CIO questions about the Performance CoE model

Q: How do I facilitate quick results?

A: Focus on the services that will resolve recurring issues, such as performance benchmarking and bottleneck identification by using the iterative approach (2-3 months per iteration).

Q: What level of investment will be required?

A: Organizations can often utilize existing technology and people and augment them to function within a Performance CoE.

Q: How do I facilitate adoption of the Performance 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 Performance CoE services with daily operations easily. At the same time, the Performance 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 Performance CoE model to compete with the alternative service providers?

A: Make certain that your processes are better and measure them with KPIs that impact your business.

Q: How do I demonstrate value of the Performance CoE?

A: It is essential to measure Performance CoE impact on the projects and Performance 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 Performance 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 performance testing and bottleneck 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 the projects where alternative providers may be under consideration. The emphasis in early projects will be the cost and speed of your services.
5. It is essential to leverage existing investments in technology, processes, and people when building a Performance CoE. Consolidating the best resources and making it work for the entire organization will be much more efficient and valuable than "from scratch" implementation and massive organizational change.
6. Robust infrastructure and automation platforms are essential to success of the Performance 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 bottleneck identification and performance tuning. You will need to ensure that every member of CoE reports all the findings in these areas.
8. Measurements collection and visualization should be automated to be truly efficient and to provide the required visibility. This is important for controlling the value of the Performance CoE and also proving the 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. The goal is to standardize processes and practices to enable lowest cost and the highest efficiency, you need to be "easy to do business with." This means flexibility to adopt your approach and your capabilities to the customer's project framework and even culture.

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