An Oracle White Paper on Enterprise Architecture
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Architectural Strategies for IT Optimization: From Silos to Clouds

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Executive Overview

In business and IT, there is no steady state where one grand plan can optimize all aspects of an enterprise's architecture. Amidst the best intentions, the dynamics of business continuously drive sub-optimal, redundant, and ad hoc IT responses. As the IT portfolio grows, IT legacy investments and architectures begin to stifle business innovation and increase operational costs. As the downward spiral accelerates, IT eventually become un-leveragable and untenable—leaving IT with the reputation of being unresponsive.

To move forward, organizations need an architectural strategy that can sustain them through the ongoing barrage of new business and operational requirements. Oracle's IT Optimization strategy is based in a comprehensive set of architectural principles that can ensure consistency and govern future decisions that will make IT more responsive, efficient, economical, and even environmental.

Using enterprise architecture techniques and Oracle technology best practices, Oracle can provide the structure and discipline necessary to help you develop your vision, and then make it a reality. In this IT optimization paper, Oracle suggests a comprehensive future state roadmap articulating the key architectural principles across rationalization, virtualization, consolidation, systems management automation, and shared services.

Oracle's white papers on enterprise architecture describe a series of practical strategies designed to provide a sustainable, value-driven IT infrastructure. Taken separately or all together, Oracle's architectural principles will help you develop future state roadmaps that will lower your IT costs and keep you aligned with the ever-changing demands from your business.

Introduction

In some circles, effective IT management is primarily focused on cost reduction and efficiency. While important, this approach misses the bigger impact that IT has on business strategy. Studies published by MIT/Sloan and Harvard Business Review, among others, demonstrate that effective enterprise architecture is necessary to the success of business strategy. In their influential paper "Investing in IT that Makes a Competitive Difference" (Harvard Business Review 2008), authors Andrew McAfee and Erik Brynjolfsson consistently found that what separated industry leaders from the rest of the pack was the use of IT to drive business innovation that led to competitive advantages. This was true across industries, from manufacturers such as Otis Elevator, to retailers like CVS and Tesco.

It is not within the scope of this paper to analyze this work in depth. Briefly though, their analysis determined that there was a pattern for success that could be broken down into three parts:

- **Standardize on a common technology platform**, rather than rely on a stitched together collection of legacy silos.
- **Innovate key processes** to improve the value or drive down cost.
- **Propagate these changes across the enterprise**, **via the common technology platform,** to convert localized improvements into strategic advantage.

By making IT into an engine that accelerates business change, these organizations were able to rapidly and effectively rollout out business strategies such as mergers and acquisitions, or new product rollouts. The study shows that, in turn, this led to market leadership.

This paper describes how to build the technology foundation that will enable this business leadership. In addition, the same foundation will also make IT more efficient by eliminating duplication and complexity. This approach is referred to as IT Optimization. It is based on several guiding principles and consists of phases that make up a logical progression. This strategy must be tailored to an organization's current state and its strategic priorities, and includes a phased approach that minimizes risk and optimizes business benefits. The rest of this paper defines the principles and best practices that define this strategy.

Scope of IT Optimization

Business Strategy

The goal of any IT investment must be to support/accelerate business strategy. While IT Optimization provides benefits towards most business strategies, there are some aspects that should be highlighted. When a business strategy requires increased business agility, then it will usually require some degree of IT Optimization. Such strategies include:

- Growth of market share via mergers and acquisitions
- Growth of wallet share via product innovation

Strategies to reduce costs also indicate the potential benefit of IT Optimization. Such strategies include:

- Reduce operating costs via process standardization
- Reduce IT costs via improved IT efficiency

Operating Model Alignment

The business operating model defines the degree of business process standardization across the organizational units and the degree of information sharing between processes. Processes that are standardized across organizations benefit the most from IT Optimization of the supporting technology capabilities, because the benefits are multiplied across all the organizations. However, even processes that are not standardized benefit from the optimization of the underlying technology capabilities.

Business Capabilities/Processes Alignment

If a business strategy requires the agility of certain key business capabilities, then you should prioritize the technology capabilities that support these. For example, this might mean that a business strategy focused on acquisitions would require the standardization and optimization of the integration technologies in order to more rapidly onboard the finance and HR systems of newly acquired companies.

On the other hand, if the primary strategy is to reduce cost, then you may want to prioritize the technology capabilities that support common, low business value capabilities/process. Thus, you might first standardize/optimize on a virtual machine architecture to consolidate a heterogeneous collection of systems onto a pool of servers to reduce hardware costs.

IT Optimization Guiding Principles

Guiding principles provide consistent structure and direction to the IT architecture. The three guiding principles for IT Optimization are Rationalization, Architecture Optimization and Shared Services/Cloud Computing.

1) **Rationalization:** IT organizations should rationalize their technology architecture by standardizing the technology interfaces and technology portfolio.

   Rationale: Standardized interfaces ensure independence and flexibility of the architecture. Various components can evolve and optimize independently from each other, and this translates directly to business agility. Standardizing the technology portfolio reduces cost and complexity, simplifies maintenance, and also increases agility.

   Implications: If an open standard exists for an interface, use it. If not, then an internal standard interface may need to be created to ensure the independence of components. Technology rationalization provides a foundation for other IT strategies such as application portfolio rationalization and business process standardization/optimization.

2) **Architecture Optimization:** All layers of the technology stack must support the business service level objectives and growth requirements.

   Rationale: Scalability, availability, manageability and security are only as strong as the "weakest link."

   Implications: A balanced technology architecture employs the supporting principles of Virtualization, Consolidation, and Management Automation to meet the business needs. Virtualization, in this case, refers to more than just CPU virtualization. Abstraction is required throughout the architecture in order to increase availability, responsiveness, and overall agility.

3) **Shared Services/Cloud Computing:** IT organizations should leverage shared services, as appropriate to reduce costs.

   Rationale: Use of shared services, including the latest version, cloud computing, can dramatically reduce the ongoing cost of IT services.

   Implications: There are many operational, security, organizational and financial aspects of shared services that need to be managed to ensure effective adoption.

Maturity Model

As an organization undertakes the IT Optimization journey, the IT architecture matures through several stages. Evolution from one stage to the next requires the consistent application of IT Optimization Architecture Principles. Figure 1 shows the technology architecture as it progresses through several levels of maturity and the related IT Optimization Principles that drives each transition.

It is important to make clear that the entire IT architecture does not move through these steps as a whole, but does so in manageable chunks. This reduces the amount of upfront investment and reduces the risk of internal backlash. Also note that not all IT capabilities in an organization need to proceed to the highest level of maturity.

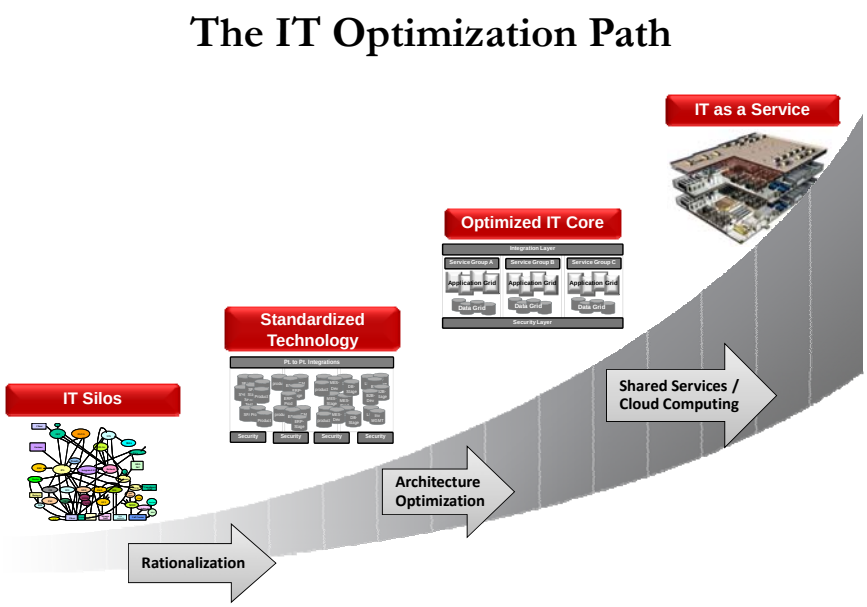


Figure 1: The Architectural Roadmap for IT Optimization

Maturity Level I: *IT Silos*. This is the "classic" collection of isolated, independent, silos with little or no corporate governance of standards or procurement policy. Many redundant and overlapping systems are supported by different types of infrastructure and technology. It is difficult and expensive to both maintain and re-configure, and therefore does not readily support change or innovation.

Applied Principle: *Rationalization*. Rationalization reduces the versions of technology and produces a set of standardized interfaces and a standardized portfolio. Non-compliant assets are migrated, isolated or eliminated over time.

Maturity Level II: *Standardized Technology.* At this stage, an organization is building on a standardized portfolio, and has already realized cost savings through reduced licenses support, as

various redundant systems are phased out, in addition to outlying skill sets required to support them. However, there are still a number of opportunities for improvement. There may be many instances of systems, various components may not be meeting business service level objectives, and provisioning and management of the systems may be slow, complex and costly.

Applied Principle: ***Architecture Optimization.*** Make the standardized portfolio into a balanced architecture that can flexibly meet current and future business growth, availability, security, compliance and manageability requirements.

Maturity Level III: ***Optimized IT Core.*** Having virtualized and consolidated systems and automated key management functions, the IT organization is significantly more effective and efficient. These activities have reduced operational costs, reduced operational risk, and improved responsiveness to the business. The IT organization is now poised for its greatest transformation—to run IT as a business. They only lack the operational, financial, and governance processes to make that happen.

Applied Prinicple: ***Shared Services/ Cloud Computing.*** Although technology does play a role in this transformation, the primary focus is on defining and implementing the processes and agreements that govern the relationship between IT service provider and the consumer. This includes financial models, contractual processes, provisioning, change management, and the requisite monitoring and problem resolution processes.

Maturity Level IV: ***IT as a Service.*** At this stage, IT is running as a business, supplying business services from an enterprise private cloud. Services are rapidly provisioned, efficiently managed, and financially effective. IT appropriately leverages cloud services from other sources to reduce cost. At this stage, the IT organization has strategically increased its value to its larger ecosystem as the low cost, high quality provider of key services.

From Current State to Future State

This section drills down into the applied principles that raise the architecture from one maturity level to the next.

Applied Principle: Rationalization

Companies may choose to rationalize all the assets in their IT environment in one project, but a "boil the ocean" approach can introduce significant risks. A more practical approach is to develop a strategy that involves multiple projects, each focusing on rationalizing only the assets that support a horizontal or vertical "slice" of business functionality, and is aligned with a business goal or objective. Choose an initial slice that is not politically or technically complex and where there is opportunity for short term savings, via license or support savings. Near term success and payback will help justify continued investment.

Rationalizing the technology portfolio involves the following steps:

Determine the Current State

1) **Capture the existing Technology Portfolio:** This can either be done manually, with spreadsheets, or with automated tools. Typical information captured includes: asset name and description, owner, location, department, number of users, packaged/custom, hardware, operating system, and database.

2) **Map the Portfolio to the Business Capabilities:** Once the inventory is complete, the organization must "map" the assets to either capabilities or business processes within Business Architecture. This makes it easy to identify redundancies and gaps. Completing such an inventory and mapping exercise will usually reveal many overlapping and duplicate assets that are candidates for consolidation. When a recommendation for an asset is not obvious, a more detailed evaluation may be required.

Define the Future State

1) **Define Technology Standards:** Define the set of open or proprietary standards that are appropriate to the scope of work.

2) **Define Technology Principles:** Define the set of technology principles that are appropriate to the scope of work. These should include the principles of Virtualization, Consolidation and Management Automation that will be applied during the next transition.

3) **Technology Portfolio Scoring:** Analysis of the technology portfolio can be simple or elaborate, depending on organizational maturity. Some common evaluation criteria include:

    - Strategic value (degree of support for business strategy)
    - Functional fit (degree of support for business capabilities or processes)
    - Conformance to Architecture principles and standards
    - Risk
    - Total Cost of Ownership

    Whatever level of analysis is applied, when the evaluation process is complete you will be able to recommend actions to take for each asset, such as:

    - Retire aging and low-value assets
    - Modernize aging and high-value assets
    - Eliminate redundant assets
    - Define asset as an enterprise standard

Governance

Portfolio management interacts with several IT processes. The governing board(s) must align with the IT organization- i.e. reflect the degree of federation or centralization. The governing

board must be involved in key points of the procurement process to ensure standards are followed. The process for exceptions to the standards must be clearly defined.

Tools and a repository will be required to support the ongoing rationalization efforts. Large organizations will benefit from EA tools that have strong portfolio management capabilities for data collection, analysis and reporting.

Business Rationale

The benefit of developing standard technology interfaces and portfolio is primarily in reducing the ongoing costs and improving the agility of the business. Quantifying the projected savings can be challenging, but estimates can be made on plausible reductions in current state. For example, projecting that the amount IT spends on maintenance will be reduced by, say 10%, within 24 months. The business analysts can help with potential benefits of improving agility. For example, if during a prior merger, the integration of financial systems took six months, what would the savings be to the business if the integration had taken only two months?

If redundant technologies can be eliminated, then projected support cost savings provide very tangible benefits. Though a small part of the overall benefit, these concrete savings can offset the perceived risk of the investment.

Applied Principle: Architecture Optimization

In addition to a standardized technology portfolio, the technology needs an architecture that can meet the business service level objectives, and has the capability to scale effectively and efficiently. To achieve this, Architecture Optimization is required. It is based on the application of three principles: Virtualization, Management Automation, and Consolidation.

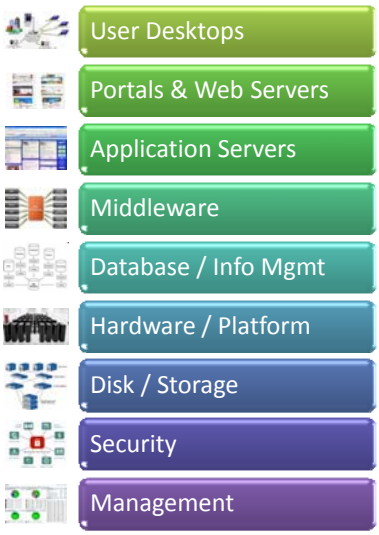
Sub-Principle: Virtualization

The heart of virtualization is abstraction, or a loose coupling between service requestors and the services themselves. Requests are satisfied from pools of resources that are invisible to the requestor and can be dynamically adjusted according to need.

Reconfiguring resources, according to demand, is key to effective IT architecture. In recent years, the focus has been on creating virtualized pools of CPU servers, for example VMware or Oracle Virtual Machine. This is a very effective technique for improving CPU utilization and handling fluctuating demand across heterogeneous workloads.

However, just focusing on the CPU layer is insufficient. Performance bottlenecks and single points of failure can occur at any layer in the architecture. A balanced system needs virtualization applied to all the layers. Many critical elements—including storage disks, database servers, application servers, and web servers—all need to be deployed as pools of resources that can be dynamically scaled and configured for failover/failback.

Virtualization Opportunities Across the Layers



- **Business Demands Agility**
  - **Deliver new resources quickly**
  - **Adjust as requirements change**
- **Multiple Resources Must Be Aligned to Meet Service Levels**
  - **Performance and Availability**
- **An Engineering Commitment**
  - **Optimal flexibility and value**

This illustration shows the many layers of a potential virtualization implementation. For each of these abstraction layers, we have provided some use case examples and their benefits:

- **Desktops**
  - Benefit: Cost savings in reduced desktop hardware and maintenance.
  - How? Virtual desktop servers run PC desktops on pools of servers, remotely accessed.
- **Portals and Web Servers:**
  - Benefit: A unified user interface and Web presence.
  - How? A Web cache virtualizes Web servers. Portals virtualize the disparate user interfaces of the backend systems.
- **Application Servers:**
  - Benefit: Enhanced application scalability and service levels
  - How? Application grids provide pools of application containers spread across hardware servers

- **Service Oriented Architecture(SOA):**
  - Benefit: More agile business processes, and easier information sharing
  - How? Service-oriented architecture principles and components, such as enterprise service bus, ensure loose coupling between suppliers/consumers of enterprise services
- **Database:**
  - Benefit: Enhanced performance, access, and protection of enterprise information assets
  - How? Database grids provide pools of database services spread across hardware servers. Data object caches virtualizes the database objects
- **Platform(OS/Servers):**
  - Benefit: Improved business scalability and availability at lower cost
  - How? Virtual machines/hypervisors virtualize pools of hardware servers
- **Disk/Storage:**
  - Benefit: Improved business scalability at lower cost
  - How? Logical disk storage managers, such as Automated Storage Manager (ASM), abstract pools of storage hierarchies.
- **Network:**
  - Benefit: Simpler and more scalable network capacity
  - How? Virtual-area networks virtualize the network for business to business messaging
- **Security:**
  - Benefit: Improved security with less complexity and reduced cost
  - How? Virtual directories provide single standard interface to disparate legacy directories
- **Management:**
  - Benefit: Improved service levels, reduced risks, and lower operational costs
  - How? Enterprise management console provide single unified view of the management tools

When these critical layers are abstracted, the result is a virtualized data center which maximizes the levels of performance, scalability, availability, and flexibility that support the business. It also reduces the ongoing complexity and cost of adding new capacity, adopting new technologies, or supporting new business capabilities.

Sub-Principle: Management Automation

Standardizing and then automating IT management processes is essential to reducing IT costs, reducing risks, and providing the business with the agility and service delivery it requires. While a complete overview of IT management is beyond the scope of this paper, we would like to highlight the following key principles:

- Adopt Best Practices
- Consolidate and Simplify Management
- Manage Scale
- Ensure Configuration Change Compliance

Adopt Best Practices

Over the last decade, the IT industry has expended significant effort in creating best practices, the result of which is a number of recommendations, concepts, and policies, including ITIL Version 3, COBIT, and ISO/IEC 20000. Leverage these guidelines for datacenter operations, IT practices, and layout practices to develop effective data centers. Iteratively address the most impactful areas based on data center needs.

Consolidate and Simplify Management

Even though the goal of IT Optimization is a more unified data center, the reality is that during the transition, there will still be a lot of heterogeneous systems to manage. With both virtualized and non-virtualized environments in operation, datacenters typically employ a variety of tools to manage these systems. The problem is that management tools tend to be niche products and limited in scope, designed as they are to solve just one piece of a much-larger challenge. What's required is a single, comprehensive, end-to-end system management tool that integrates physical and virtual management across the hardware and software stack and the entire system lifecycle. It should support both the heterogeneous and virtualized nature of today's datacenters, as well as the traditional model of one operating system and application per server. It should be able to navigate the complex networks often found in application silos, helping solve the immediate problems of many datacenters.

Manage Scale

Although the specialized needs of complex high-performance computing (HPC) applications—such as those for scientific research, manufacturing, electronic design, and financial services—might seem to have little to do with day-to-day enterprise datacenter operations, many of the trends embraced by these applications are now finding their way into datacenters.

Rack-at-a-time deployment. Large HPC grids refresh their servers on a regular rotating schedule, bringing new racks of servers into the grid and retiring old ones on a monthly or quarterly basis. Today, many enterprise datacenters are also deploying servers on a rack-at-a-time

basis. This model not only helps datacenters support rapid application growth, but it's also ideal for organizations with highly cyclical workloads.

Work at scale. When tools work at scale, it's as easy to provision and manage 10, 100, or 1,000 servers as it is to handle a single one. This lesson from the HPC world is becoming increasingly relevant in enterprise datacenters deploying racks or pods of systems at once.

Hardware recognition. When racks, pods, or containers full of servers are deployed at one time, it's important for tools to understand the server hardware. Effective tools perform bare-metal discovery and integrate new equipment into datacenter infrastructure in less time and without introducing the chance for human error. The result is that new resources can be put to work just hours, not days or weeks, after they arrive on the loading dock.

Heterogeneous environments. With a constant flow of new equipment being introduced into both HPC grids and enterprise datacenters, heterogeneity is the norm. Management tools must be able to handle the latest innovations, as well as equipment that's been on the datacenter floor for years.

Holistic approach. On HPC grids, application instances must be assigned to servers based on an intimate knowledge of that server's connectivity to storage and adjacent servers with which it must share information. In today's enterprise datacenters, it's equally important for any management system to have a holistic view of server, network, and storage resources.

Ensure Configuration Compliance

Although many IT organizations have developed and documented operational policies, many are still finding these inadequate to meet the constant pressure for managing their Configuration Compliance. One of the main issues customers are experiencing is the inability to translate policies into processes and procedures that produce real-time, measurable metrics. The result is internal controls that are inefficient at managing today's level of complexity and quantity of changes.

To ensure that configuration compliance practices comply with regulatory, security, and service quality requirements, organizations need automated systems that implement company policies, and provide real-time metrics.

A Configuration Change Console is designed to help organizations by providing an IT framework that connects IT policies, and controls directly to the data collection. This includes tracking and recording both manual and automated actions and events against configuration items, applications and IT components as part of the normal daily operations. It also requires a centralized repository to manage IT policies and controls to map the detected actions and events against it. Connecting data and practice to company policies improves reliability, security, and performance—in addition to meeting compliance requirements.

Sub-Principle: Consolidation

Consolidating applications, systems, or data centers, reduces costs and simplifies operations. Consolidation, however, is a case of putting more eggs in a single basket. In order to consolidate successfully, you need to ensure that you have a "stronger basket."

The principles defined above, of virtualization, management automation, and the standardized processes, defined by ITIL, help ensure that IT operations and systems are more robust. There are many other aspects of resiliency, such as security and disaster recovery that also need to be enhanced. By consolidating, however, you can afford the investments needed to implement more robust technologies and processes, and thus the consolidated systems can indeed be made stronger.

Effective consolidation must also take into account the nature of the workload and the supporting technologies. For example, you may want to consolidate the databases of two different applications. If the applications currently run on different versions of the database, you may decide to keep each software stack pristine, and use CPU virtualization to simply consolidate the applications onto a pool of hardware servers. This would be very low risk.

On the other hand, this means that your Database Administrators would still have two different instances and versions of databases to manage—thus keeping your administration costs higher. It may be worth performing the testing to consolidate onto a single database instance. This is where automated testing tools, can be used to enable a greater degree of consolidation. Managing consolidation requires a very disciplined and methodical approach, as well as a thorough understanding of technologies and dependencies. Fundamentally, the right degree of consolidation depends on the maturity and skill level of the IT organization.

Governance

The governance of Architecture Optimization will be carried out by the same review boards established for rationalization. They will have business and IT representatives in order to ensure that the business service level objectives are both accurate and up to date. The IT architecture will be driven by and validated against these objectives. And throughout the test and into production, the actual systems will be measured against these same metrics.

In ongoing business planning, IT architecture will be represented on the planning board to ensure the continued alignment between business strategy and IT strategy. Further architecture studies will be commissioned as needed to provide input to the joint business/IT planning process.

Business Rationale

The primary business rationale for Architecture Optimization is the benefit to the business in achieving its service level objectives for performance, availability and its targets for growth. Another key business benefit, is of course, the agility - particularly in provisioning new capacity

or in handling major fluctuations in peak usage. In financial trading markets, for example, metrics such as response time, peak load capacity, and availability are crucial to business success.

The secondary business rationale for Architecture Optimization is the reduction in operational costs that a well tuned and managed system provides.

Applied Principle: Shared Services/Cloud Computing

The previous sections describe how to develop an optimized architecture for a set of technology services. Traditionally, these services are consumed by the business side of the same organization. However, IT organizations may also decide to make these services available to other organizations as a shared service. Conversely, the IT organization may also decide to become a consumer of shared services from other organizations. The latest form of shared services, is referred to as cloud computing. Services provided by external organizations are referred to as public clouds, while those contained within an organization are private clouds. A range of shared service types are available.

Whether supplying or consuming shared services, several principles apply:

- Deploy on an optimized architecture
- Ensure legal and regulatory compliance
- Focus on the governance

Deploy on an optimized architecture

With shared services/cloud computing, the service provider must focus on the principles and processes outlined in the prior sections. Without an optimized architecture built on a standardized portfolio, with standardized interfaces, the service provider will not be able to effectively provide the quality of service and the required agility at an attractive price required to keep their customers happy and beat the competition. Conversely, a customer of shared services needs to be aware of the architecture of his supplier, which will indicate his ability to provide the required service.

Ensure legal and regulatory compliance

Public clouds have the disadvantage of hosting your data in an offsite organization outside the legal and regulatory umbrella of your organization. In addition, as most public clouds leverage a worldwide network of data centers, it is difficult to document the physical location of data at any particular moment. These issues result in potential regulatory compliance issues which preclude the use of public clouds for certain organizations or business applications.

Focus on the governance

In addition to having a solid architectural foundation, the most important aspects of shared services lie in the governance and the management processes. Organizations must establish clear operating agreements between the providers and consumers of these services. Both sides need to understand the details and consequences about areas such as change management, financial chargeback, and problem resolution.

For example, since change management is costly for service providers, they typically need to supply only "vanilla" versions of services. The consequence for consumers is that they should use these shared services for their more generic, non-strategic business services that do not need process customization, which would be difficult to negotiate with the provider.

Financial chargeback models must both incent consumers to use shared services and discourage them from creating duplicate services. Whether this is done via a command control model, in which consumers are measured and tracked on their use of such services, or by a market model, whereby consumers are compelled only by potential cost savings, is closely intertwined with the overall organizational model.

The governance agreements for shared services should be begun early in the lifecycle, even before the technology prototypes and planning. The governance and process rules will remain consistent even as the technology aspects of shared services evolve.

Business Rationale

Shared services/cloud computing can provide significant cost savings to consumers by offloading key capabilities to specialized providers that can manage them at lower cost. Public cloud services hold significantly greater risk, because the supplier is not under direct control of the consumer. The potential cost savings must be significant to offset the potential risks and legal complexities. Organizations with weaker IT organizations may be able to more justify the use of shared services as compared to providing a service themselves. Risks may be mitigated by selecting non-critical, low risk services first.

Providing private cloud services to other LOB's within the same organization, makes a lot of business sense. The gains of consolidation and offloading are there without the attendant legal and contractual risks, of public clouds. The use of central IT, to provide common shared services to other sister organizations is a mature and well understood IT business model. These services typically include infrastructure, as well as database and middleware, including security and integration. Common application services are another easily justifiable opportunity for private clouds.

Enterprise Architecture: Structure and Discipline

Any transformation of this magnitude is an extended process which requires structure and discipline to be successful. Therefore, this last section provides an overview on how an enterprise architecture approach is imperative for effecting strategic IT change.

At its highest level, Enterprise Architecture (EA) is a method and an organizing principle that aligns functional business objectives and strategies with an IT strategy and execution plan.

Practically speaking, creating an Enterprise Architecture from scratch would be a daunting task, so EA frameworks are typically used to guide an architect through the critical areas of an architecture, while also simplifying the architecture development process. We will briefly discuss Oracle's approach to Enterprise Architecture through the Oracle Enterprise Architecture Framework, and the Oracle Architecture Development Process.

Oracle's Enterprise Architecture Framework

Oracle's EA framework—influenced by TOGAF, FEA, and Gartner—is what Oracle relies on to help our customers align their IT capabilities with their business strategy. Simple and practical, the Oracle Enterprise Architecture Framework (OEAF) is designed to provide "just enough" structure, "just in time" to meet the business requirements of the organization. It consists of:

- **Metamodels**: to define the taxonomy and relationships that make up the architecture.
- **Principles, Standards and Reference Architectures**: to define future state.
- **Tools**: to create and manage artifacts and building blocks.
- **Process**: to ensure quality and consistency in the architecture development.

The process of the OEAF is formally referred to as the Oracle Architecture Development Process (OADP) and consists of four phases:

- **Architecture Vision**: Use the business strategies and business capabilities/processes, to define guiding architecture principles and the scope of effort. Includes an architecture maturity assessment.
- **Current State**: Assess existing IT capabilities/processes in relation to the business strategy, business capabilities/processes and defined scope. Includes governance, and ongoing costs/risks.
- **Future State**: Define the required IT capabilities/processes to support the business strategy. Includes gaps/redundancies, priorities, tradeoffs, business rationale and governance.
- **Strategic Roadmap**: Define recommended roadmap to the future state. Includes transition architectures, business rationale, governance, risks and tradeoffs.

Summary

IT Optimization moves the IT organization through a series of stages via the application of key architectural principles. The result is an IT organization that more effectively delivers services to the business, with higher quality and lower cost. The pace and sequencing of that process varies by organization. Lessons learned can be adopted as the process is repetitively applied across various dimensions of the IT architecture.

Enterprise architecture provides the structure and discipline across all the phases of IT Optimization. It reduces the risk, improves the quality, and ensures the alignment between the business strategies and the IT capabilities required to achieve them.

As a result, the business units can more rapidly deliver new and enhanced products to their customers. Some of these may even be delivered to new customers via the cloud computing paradigm. All of this allows the business to expand existing markets, or enable mergers and acquisitions that open new markets. Such business agility is essential in today's fast paced economy, and those who master it, become the industry leaders.

As a global technology leader, Oracle has had a decade of experience across myriad industries, helping customers realize the business and IT benefits of disciplined IT approaches. Oracle offers many resources, including expertise, architectural and organizational processes, and a portfolio of tools and reference architectures, to help companies of all sizes along the IT Optimization maturity curve.

For more details on the Oracle Enterprise Architecture Framework (OEAF) and Oracle Architecture Development Process (OADP), other enterprise architecture topics, and to participate in a community of enterprise architects, visit the OTN Enterprise Architecture Center at: http://www.oracle.com/technology/architect/entarch/index.html.

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