Enterprise Portal Rationalization: Using a Service-Oriented Architecture to Stop Web Asset Sprawl
Executive Overview

Many IT organizations today are struggling under the burden of Web sprawl. Disparate e-business initiatives, mergers and acquisitions, and a rapidly consolidating software industry have combined to create complex and heterogeneous Web environments that are enormously costly to manage. Too much time and effort are spent maintaining and upgrading disparate sites and architectures, while too little is invested in new initiatives. Security and user management is inefficient, and often must be re-architected for each new application. New projects end up requiring duplicative development, as heterogeneity prevents re-use or requires extensive custom integration of existing systems. What few new assets do manage to get developed end up undersubscribed, as users find themselves overwhelmed by a vast number of sites, portals, and services. Bogged down in the sprawl, many IT managers find it impossible to get a panoptic view of what is going on in the business, and struggle to meet the ever-more-quickly evolving needs of customers, partners, and employees.
Introduction

A rationalized approach to developing and managing Web assets allows IT to meet business demands cost effectively, flexibly, and quickly while reducing ongoing maintenance and development costs. Rationalization is a primary goal of many IT departments today; CIOs are focused on rationalizing the systems they have to make their organizations more agile to change.¹ To reach this goal, many Oracle customers are actively implementing a strategic vision of a standardized Web infrastructure that lets developers meet business requirements more rapidly by providing a common platform for service delivery, enabling existing systems to work better together, and improving application security. By taking a methodical and incremental approach to controlling Web sprawl, Oracle helps make IT more productive while reducing maintenance costs of outmoded Web applications. Oracle’s service-oriented architecture (SOA) and portal lifecycle management tools provide the benefits of a single platform without losing the flexibility that constituents need to build custom-fit portals. The increasing costs of Web sprawl, emerging portal and Web services standards, and the openness and standards-based approach of Oracle’s platform make it the optimal time for organizations to develop plans for a rationalized and unified future.

This paper provides an overview of the problem of Web sprawl, and an account of the rationalization strategies organizations are adopting to gain the upper hand on sprawl. Adopting a service-oriented architecture based on integrated application platform infrastructure emerges as the key to rationalizing sprawl.

Web Asset Proliferation – A Common Problem

As Web-based computing exploded in the 1990s, most organizations made significant investments in building Web sites and portals to serve a wide variety of constituencies. Given the newness of the technology and the pace at which it changed, most organizations developed early portals to meet tactical business needs and to serve particular audiences. Examples include customer service portals or HR portals for employees. These sites were often developed in-house to meet business requirements or were purchased “off-the-shelf” from primitive portal and e-commerce application providers. The result was a proliferation of architectures, as portrayed in Figure 1.

Many enterprises today are struggling with mish-mash Web architectures that are costly and inefficient to maintain. This complexity and heterogeneity also inhibits IT’s ability to meet emerging business demands efficiently. Analysts estimate that IT departments spend approximately 90 percent of their budgets maintaining existing applications and only 10 percent developing new ones. IT departments are also struggling to ensure they have all of the needed skills on hand to maintain their existing portals and Web-based tools. Early Web applications were often built before some of the newer portal and Web services standards existed and they are instead built on a vendor’s proprietary architecture and APIs. Integration between existing applications is therefore complex, with little potential for re-use. Security can also suffer, as it may have to be re-architected for each new application. IT departments are spending too much...
time, money, and effort maintaining and integrating various architectures, redundant servers, and numerous applications.

Similarly, user experience suffers. While portals and the Web have empowered users with self-service options, most users today have to use too many portals and sites to accomplish their goals. To be effective, portals must be designed from the end-user perspective, enabling the user to accomplish as many tasks as possible while visiting the fewest number of portals. This requires rethinking the way that portals are built, moving from a functional business unit perspective to a user-focused, process-oriented point of view.

Many IT departments today are looking for ways to rationalize these Web environments. Without rationalization, IT too often finds itself unable to keep up with evolving business demands. IT is always re-building to meet new requirements, which is time consuming and only exacerbates the sprawl. Many IT departments lack the additional manpower and budgets to roll out new portals or services to meet business needs because so much time and money go to maintenance of the existing architectures. This makes IT too slow to respond to the business—its number one priority.

**A Service-Oriented Architecture for Rationalization**

Despite the problems associated with Web sprawl, customers continue to deploy more and more portals. According to Gartner, “The portal fabric is coming, and it will change the way users interact with portals — instead of users adapting to individual portals, the portals will adapt to the users.” To realize this vision, it is imperative that organizations quickly gain the upper hand on the burgeoning sprawl within their organization.

The goal is to create a master portal that will serve as the primary system of access through which users of all types can find the services, applications, tools, information, and data they need. In this environment, multiple sites with separate log-ins are eliminated. Applications that traditionally might have had different user interfaces surface through the common presentation layer of the portal. Relevant data is pulled from disparate repositories and targeted at specific users. Based on a common set of platform components, this unified portal architecture enables IT to focus on delivering new services while simultaneously re-routing access to existing resources through this portal framework, leveraging its common components.

To create a single portal environment that can serve all users, a portal must be designed using a service-oriented architecture (SOA). Figure 2 depicts this platform-based and service-oriented approach to portal development. It is based on a common set of components that are re-used across services, initiatives, and applications. Solid foundation components for application development and integration allow disparate systems to communicate in an environment that is scalable and robust enough to meet enterprise demands. Enterprise security layers on top of these components ensure that user data and security services aren’t duplicated every time a new application is developed. A portal framework leverages all of the underlying components of this
platform to deliver disparate services to a wide range of users in a way that is scalable and secure. The portal provides the framework to ensure that each user’s experience is personalized and that management of service delivery is standardized.

SOA is a critical component of this design. Butler Group notes, “SOA provides abstraction that removes the complexity of dealing with many different technologies, exposing the application functionality as technology-independent services.” By building a portal infrastructure on a solid SOA, the portal environment will be flexible, robust, scalable, and process-oriented. Encapsulating business processes as Web services, SOA makes these components available to the portal environment. In a service-oriented architecture, each layer in the architecture is buffered from changes in the other layers. Moreover, because these Web services are available for reuse, SOA improves developer productivity and accelerates IT’s ability to respond to the business. Ultimately, basing a portal or network of portals on SOA reduces the amount of new code needed to roll out new portals, or to extend existing portals.

Figure 2: Unified Portal Architecture


Rationalize For Future Flexibility and Reduced Costs

One of the key benefit areas of rationalizing Web architectures and platforms is having a service-oriented architecture that is standardized. A standardized, service-oriented architecture will greatly increase IT’s ability to meet business demands in a timely and cost-effective manner. IT will be more agile, will spend less time integrating and re-architecting services, and will be able to roll out new services quickly that leverage common platform components. Because it standardizes the user experience of all the Web assets in the enterprise, a unified portal architecture will help increase adoption and usability of new services, as they will be delivered through a common framework with which users are already familiar. Because it also standardizes the administration and security frameworks for new Web applications, the unified portal architectures also makes it easier and more cost effective to deliver new services and functionality. Moving forward, IT will work in an environment of increased stability and security that enables it to better meet business demands.

Rationalization also helps IT reduce its overhead and maintenance costs. Cost savings are primarily realized by reducing the amount and the complexity of infrastructure. Rationalization reduces the number of heterogeneous platforms and applications that IT has to support, allowing IT to reduce the cost of software by cutting maintenance costs, reducing the number of servers, shrinking its pool of vendors and licenses, and consolidating skill sets in a few key areas. It can also reduce the cost of hardware as servers can be consolidated when older applications are eliminated in favor of delivering services via the new framework.

Oracle Portal and User Interaction Platform for Architectural Rationality

Oracle’s Portal and User Interaction solution, WebCenter Suite, provides a comprehensive service-oriented foundation for highly scalable custom portal solutions. Oracle WebCenter Suite is a comprehensive set of products used to create social applications, enterprise portals, collaborative communities, composite applications, and Internet/Intranet Web sites -- all built on a standards-based, service-oriented architecture. Key components of the Suite include: WebLogic Portal, WebCenter Interaction and WebCenter Services.

Oracle WebCenter Suite is tightly integrated with Oracle WebLogic Server for high performance and reliability. The Suite provides industrial-strength capabilities for rationalizing Web asset sprawl including flexible deployment options, federated architecture, and support for transactional composite applications and rich Internet applications. Oracle provides the products and technologies needed to create a single, streamlined portal environment based on a service-oriented architecture. This platform is flexible enough to ensure that diverse business and user needs are still met via this consolidated architecture, while IT is able to be more agile.
Of course cost savings and flexibility benefits must be offset against the costs of standardization. The key here is that rationalization will not be a one-time, do-it-all-at-once project. The Oracle platform enables customers to reduce sprawl incrementally, while immediately making IT more efficient and cost effective. There are multiple ways to begin down the path towards a rational future. One Oracle customer that is actively working towards a standardized Web architecture by integrating more than 200 disparate Web applications cites a “75 percent rule of thumb”: if an application requires more than a 75 percent re-work to meet new demands, it is eliminated and re-written as a service to be delivered via the centralized portal platform. Access to other applications is simply re-directed through the portal, with the underlying application remaining virtually unchanged for the time being. New services are developed natively for the portal environment.

Oracle offers the flexibility in the platform that allows organizations to begin by addressing specific business goals, while putting in place the foundation that will help realize the strategic vision of a rationalized future. Most importantly, Oracle and its customers have deep experience supporting SOAs, and recognize that SOA and portal rationalization are as much a journey as they are a destination.
Oracle Solutions to Rationalization Requirements

Motivations for starting a rationalization project vary. One large banking customer started a large-scale project to create a single portal architecture in order to reduce costs associated with developing new applications, manage overall branding consistency, and improve security. Another Oracle customer began delivering services through a unified portal architecture as it was looking to reduce the number of disparate upgrade cycles associated with separate portals. The lack of a unified view of enterprise information, inconsistent user interface (UI), no unified security, and little re-use and code sharing are common pain points that drive rationalization projects.

Unified View of Enterprise Information

The difficulty of obtaining a consistent, unified view of enterprise information hinders usability for internal and external users who complain that the services and information they need are spread across too many different Web sites and portals. Without starting to work from a common platform and set of architectural components, new service delivery generally requires the development of new applications or portals, which only increases sprawl. Oracle’s portal solutions that make up Oracle WebCenter Suite are designed to allow organizations to seamlessly present a unified view of enterprise information tailored to a particular user’s role and preferences.

Oracle’s portal solutions provide the framework that in essence becomes the system of access discussed earlier. This framework provides the delivery mechanism for myriad services, applications, and data sources. In order to serve as a primary system of access, Oracle’s portal solutions also provide access to unstructured content and to other users via integrated search, content management, and collaboration tools.

A portal can provide users with a unified view of information only if it leverages a common set of platform components that allow for integration of the necessary systems and data sources. Oracle WebCenter Suite leverages Oracle WebLogic Server, Oracle SOA Suite, Oracle BPM Suite and Oracle Data Integration Suite to create a tightly integrated platform that can provide users with a truly functional, unified view across systems and services.

Oracle SOA and BPM Suite enables communication between disparate back-end systems. Business process management tools for modeling, automation, and analysis that are part of Oracle BPM Suite offer sophisticated process development, management, and integration capabilities. In addition, Oracle Data Integration Suite provides a virtual data layer that federates queries across disparate structured and unstructured data repositories. Processes and data can then surface in Oracle WebCenter Suite, giving users access to all the data, systems, and services they need while working from a single portal interface.
Analysts note that the abstraction layer and process integration capabilities that rely on integration broker technology are a necessity of defining Generation Three portal technology. Portals that are developed without leveraging this sort of integration layer rely on portlets that have one-to-one connections between the portal and back-end systems. These connections are fragile and require that the user viewing the portal do the integration work required to understand the context and relationship between different portlets.

Oracle WebCenter Suite, Oracle SOA Suite, Oracle BPM Suite and Oracle Data Integration Suite rely on the market leading Oracle WebLogic Server. Oracle WebLogic Server was designed to manage large and complex sets of applications in a single architecture and therefore it is the foundation of the infrastructure required for a single, service-oriented portal architecture. It provides the clustering, security, and data access that are crucial to the portal and ensures that the architecture is scalable, clustered, fault-tolerant, and robust.

Overall, the Oracle solution described above adheres to all the standards required for an open environment. Oracle works with a wide range of technology partners to help ease customer integrations and to provide customers with complete solutions. Creating a unified view of information requires that users have access to all of the tools, applications, and data sources that they need to do their jobs. Oracle’s openness and wide breadth of partnerships across the software industry help customers quickly and easily bring other standards-based and industry-standard tools and applications into the portal environment.

Unified Security

A rationalized, centralized security environment that can be re-used by new services is a critical component of a unified portal architecture. Without it, organizations are constantly re-architecting security for every new service or application that is developed. This threatens the integrity of the security environment, as data is stored in multiple places, with many opportunities for it to get out-of-sync. It’s also expensive to re-invent the security wheel with each new application. User experience suffers as users are constantly prompted for user ID and password as they move between applications.

Oracle’s Identity and Access Management Suite (IAM Suite) provides the critical application security functions that a unified portal environment requires. Oracle IAM Suite is a cross-enterprise application security infrastructure solution that simplifies the process of securing enterprise-class applications built on both Oracle WebLogic and non-WebLogic infrastructure. Oracle IAM Suite enables shared security services, such as authentication, authorization, and auditing, to be leveraged by applications across the enterprise. Oracle WebCenter Suite can utilize Oracle IAM Suite as its runtime security framework, and as a result can benefit from a common security infrastructure as well as the enhanced capabilities that Oracle IAM Suite provides, including support for the Security Assertion Markup Language (SAML).
The central gateway provided by Oracle’s portal solution works in conjunction with Oracle IAM Suite to provide users with single sign-on from the primary portal system of access. Once a user has logged into the portal, Oracle IAM Suite can then use this information to seamlessly authenticate and authorize the user for the rest of the services and systems that are delivered via the portal, even as the user technically leaves the portal to operate in another application.

Consistent User Interface

The need for a consistent user interface is a business requirement and is also a key component of improved usability. Business owners are looking for standardized branding across all Web properties. This can be a difficult, manual, and time-consuming objective when these different sites and portals are running on different products, platforms, and architectures. Similarly, users are harried by the myriad interfaces they encounter as they move from portal to portal.

Using Oracle WebCenter Suite as the primary delivery mechanism for new services allows IT to deliver services more quickly as they don’t have to develop UI components again and again; the portal provides the presentation for new services. This makes IT more responsive and also avoids the costs associated with duplicative UI development. Oracle WebCenter Suite provides the framework to centrally control the look-and-feel of one or multiple sites. UI elements such as skins, skeletons, and themes are imposed at the highest portal level, and then inherited down to sub-portals and pages and portlets. However, departmental or business owners of sub-portals and pages can be given the right to override the master UI framework, so that individual pages or page elements can have a totally different look and feel from the master portal. Moreover, the portal can detect the kind of device or client (for example, a specific make of cell phone, a PDA, or a particular Web browser) that is accessing the portal, automatically reformating the content in a form appropriate to the device or client. As a result of these degrees of flexibility, Oracle WebCenter Suite enables central control while still being flexible enough to meet distinct departmental or business unit demands. The portal solution allows for a common UI across sites or for this interface to be highly customized so that different user groups see entirely different portals, even though they’re really being served from a common set of components and content.

Because Oracle’s solution provides a unified view of disparate information and data, it also helps to improve the overall user interface experience. Rather than forcing users to go to different Web sites that all have different interfaces, Oracle SOA, BPM and Data Integration Suites pre-integrate process and data from underlying systems before these functions are surfaced within the single, consistent UI of the portal. Integration happens before data gets to the presentation layer, alleviating the need for users to do ad hoc “integration” by viewing two portlets that are next to each other, or worse yet, having to go to different sites to find related information or processes.
Increase Code Re-Use and Sharing

Re-use of portal and application components in new initiatives can be nearly impossible in heterogeneous architectural environments. IT spends significant amounts of time integrating existing systems and developing code for functions that exist in other applications, but are not re-usable. Increasing re-use and reducing the amount of new development that is required for the delivery of new services is a primary benefit offered by rationalization.

Oracle WebCenter Suite provides a standardized framework through which services can be delivered. These services are able to re-use common components provided by this framework, eliminating the need to redevelop these components for each new application. Presentation layer and security services are two good examples of services that the portal provides which can be re-used again and again for each new service that is created. Entirely eliminating the need to develop these components for new applications is a huge cost- and time-saver.

Oracle provides an integrated development environment that is used across all the Oracle products. It provides a framework to develop portals and portlets, as well as other applications that run on the platform. Its user-friendly visual environment welcomes portal managers and business analysts, enabling a broader set of users to develop portal components.

Support for emerging standards in the Oracle solution also can reduce the amount of custom coding that must be done in the creation of new services. Oracle is a leader in developing and supporting these standards. Oracle WebCenter Suite consumes Web services based on the Web Services Remote Portlet (WSRP) specification. This means that an Oracle portal solution can easily incorporate, and deliver as a portlet, any Web services that include the WSRP description for portal presentation. Oracle also supports the JSR-168 standard for portlets, which creates a standard portlet API. This means that any portlets written to this standard—whether they were built for an Oracle portal solution or for another vendor’s product—is “plugabble” into the Oracle WebCenter Suite environment. The uptake of these standards will greatly increase the amount of re-use and reduce the custom development required to develop portals.

The Outcome: A Process Portal

A common platform and architecture that is used across portal initiatives, essentially creating a single virtual portal that serves all users, will deliver the ultimate cost-saving, flexibility, and efficiency benefits. While rationalization projects can—and most often will—be addressed incrementally, having a strategic vision of a single, standardized, service-oriented architecture that will work across the organization is the key to ultimately achieving IT agility and cost savings.

A single portal architecture that is service-oriented can create an environment where each individual user has a highly personalized process portal. When applications are de-composed so that presentation and business logic are separate, with the portal providing the primary system of access, underlying logic becomes re-defined as services. These services can be called in different
ways by the portal and its underlying components in ways that represent business processes. As these services are disseminated via a common user-facing platform, each individual user will ultimately have a highly tailored process portal. Once the infrastructure is in place, the portal can provide the connection points to truly manage processes. Integrated workflow and process management technology included in Oracle BPM Suite, combined with Oracle WebCenter Suite’s wide access to services and data, enable the user to access one portal to manage business processes start to finish. This vision is not possible in an environment where the user must go to multiple portals and distinct applications to retrieve data, input data, and complete transactions. Without rationalization and standardization, this vision can’t become a reality.

Getting to this vision of a user-focused process portal based on a single platform and architecture will not happen all at once and there are multiple paths to get there. Some applications may be turned off and replaced by new services delivered via the portal. Other applications will be re-routed so that the portal is their primary access point. It isn’t practical to expect that all applications will be migrated or rebuilt on a common platform at one time.

Instead, forward-thinking customers are choosing a single project, such as employee self-service or call center automation, as point of entry for standardizing on a single portal architecture. Although building the underlying components of a portal using a service-oriented approach may marginally increase the cost of the first few portal projects built this way, in the long run, the marginal cost of incremental portals built on the standardized portal infrastructure will be lower and lower, as new portals are able to draw on an ever-increasing assortment of reusable portal services. The flexibility and extensibility of the Oracle platform enable it to be used to take different approaches to rationalization that best suit business, organizational, and technical requirements. Most likely, multiple approaches will be used for different applications and different phases of the project.

Rationalization Requires More Than Technology

Oracle has helped many customers address sprawl problems to realize cost-saving, efficiency, and increased flexibility benefits. These customers have found that success lies as much with organizational, political, and business issues as with technical capabilities. Customers who have been successful in creating rationalized environments credit their success to several factors:

- Strong management buy-in
- Cross-functional, independent teams that report at the CIO/CEO level
- Cross-business consensus (geographies, departments, business units)
- Portal design centered on the user, not the functional business unit creating the content
Portal rationalization also gives a new charter to shared services organizations. Shared services organizations provide a single, specialized unit within central IT that focuses on providing standardized, repetitive, transaction-intensive processes on behalf of the entire enterprise, enabling the enterprise to save money through economies of scale and process efficiency. Although the original purpose of shared services organizations was to centralize finance and accounting, human resources and indirect procurement; the proliferation of Web properties dedicated to each of these areas has often blocked the realization of the shared services vision. Additionally, the shared services organizations are often reduced to a team that deploys single sign-on to otherwise silo resources that retain their dedicated Web sites.

However, a shared services organization often represents the ideal group both by mission and temperament to take on the role of leading the portal rationalization initiative. As managers of core services, they can impose standards across the business that will allow for the standardization of sign-on, user interfaces and administration. In cutting edge IT organizations such as financial services and telecommunications companies, shared services organizations are finding themselves charged with the dissection of cross-application shared services. Instead of just orchestrating services within a single application stack such as SAP (as with Netweaver), the shared services group using the Oracle solution can orchestrate services across heterogeneous applications. Shared services thus leverage the Oracle solution's core capabilities of distributed services and transaction processing.

In response to widespread heterogeneity, inconsistent branding, and spiraling costs, one Oracle customer, the Latin American operations of a diversified financial services company, has created a centralized architecture and platform that serves as the central portal framework for the region. To date, more than twenty-five previously distinct sites have been merged into this unified portal architecture, though the change is seamless to users who still see highly personalized, localized, and targeted portals. To achieve this goal, the project owner created a cross-functional team with line-of-business and technical representatives from all the member countries. The objective of this group was to build consensus about why a standardized platform was necessary, what was required to achieve it, and what specific technologies would comprise the platform. This cross-organizational team and consensus then enabled the group to push the required changes into all levels of the regional organization.

Another factor in creating successful, rationalized portals is to design the portal from the perspective of the end-user. Too often portals are developed by a specific functional group, such as marketing or HR, that designs the portal to meet the needs of that publishing group as opposed to the user. In this scenario, the user must determine which internal group might publish needed information and then access multiple portals. The goal of a user-focused process portal should be to create an environment where there is just one portal and that portal will deliver the right information and services to the user based on his roles, requirements, and privileges. Designing portals with this end goal in mind will help lead the organization to a rationalized architecture.
Return on Investment from Rationalization

Web asset rationalization generates three basic sources of ROI:

- **Cost savings related to rationalizing existing assets**: The cost savings related to rationalizing existing assets can be relatively easily measured, but must be thought of expansively to capture the entire scope. The most obvious benefits have to do with being able to sunset outmoded applications. In addition to software maintenance costs, migrating existing applications to more modern, efficient infrastructure can also reduce hardware costs. Another more subtle benefit is that one no longer must maintain the internal expertise needed to support the outmoded applications. Finally, ROI calculations should factor in the benefit of reducing exposure to unstable vendors.

- **Cost savings related to future initiatives**: Of equal if not greater importance is the ROI associated with deploying future applications on a rationalized service-oriented architecture. Research has shown that deploying a new application on a pre-integrated application platform suite, like Oracle’s integrated solution, typically costs 22 percent less than deploying the same application across non-integrated platforms. However, this is just the cost saving for the first project. Once the master portal is in place, future portal applications can leverage the user interface, security, and administration framework established in the master portal, generating even greater savings. (One Oracle customer is saving over a million dollars a year just by eliminating the need to QA new Web applications for security holes.) Finally, the shared services layer of the SOA provides a rich pool of reusable resources, driving even greater cost savings.

- **Greater enterprise nimbleness**: Although these immediate sources of return on investment are often crucial for cost-justifying a rationalization initiative, the ultimate motivator is usually more strategic. In general, standardization of security and user interfaces improves user satisfaction. On the extranet, rationalization can drive cross-selling and cross-marketing opportunities. On the intranet, deploying a rationalized network of process portals can radically improve employee productivity. Finally, rationalization is typically a requisite first step in implementing outsourcing and off-shoring strategies.
Conclusion

Portals have offered self-service and efficiency benefits since their early days. However, the Web sprawl that has affected many enterprises limits IT’s ability to effectively meet business demands while also creating a complex and confusing environment for the end-user. Rationalizing portal environments on a common architecture and platform will help reduce costs, while increasing the agility and flexibility of IT.

Oracle provides a robust and flexible platform that enables IT to create rationalized infrastructures based on a service-oriented architecture. The integrated solution of Oracle WebCenter Suite, SOA Suite, BPM Suite and Data Integration Suite all running on Oracle WebLogic Server and combined with Oracle Identity and Access Management Suite, offers unparalleled tools and technologies for standardization, all based on a market-leading, robust, scalable, and standards-based platform. This platform is enabling Oracle customers today to reap the benefits of rationalization, by reducing ongoing maintenance costs and enabling future flexibility. Rationalization can reduce complexity, streamline development, increase the sophistication of application to portal integration, and make portal management and service delivery more efficient. Oracle enables an incremental approach to rationalization that allows IT organizations to start planning today for a rational future.