



DEFINING AN ENTERPRISE-WIDE BUSINESS PERFORMANCE MANAGEMENT ARCHITECTURE

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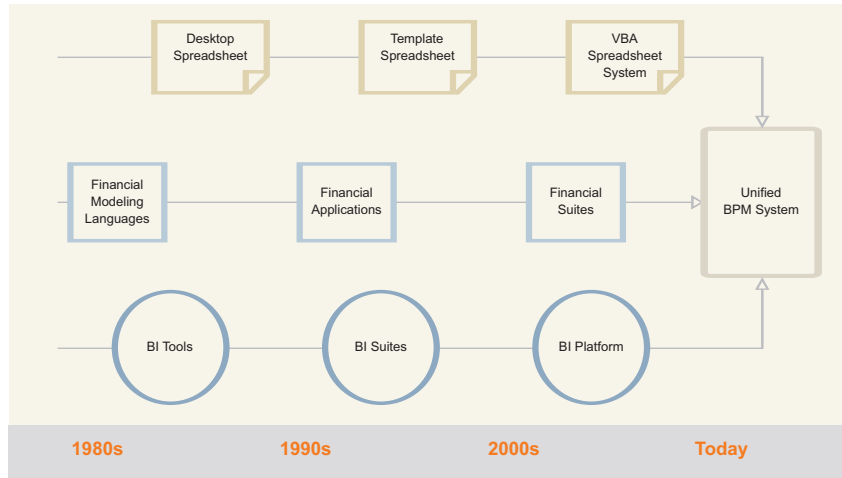
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For many years, organizations have been deploying information technologies to help solve business analysis problems. The goal has been to drive performance visibility for better decision making. An assortment of reporting tools, such as OLAP engines, packaged applications, custom code, spreadsheets, and VBA automation have been used in an attempt to address these issues. In the end, they only deliver point solutions that can't scale much past their initial footprint. From an Information Technology perspective, the task of managing and maintaining disparate reporting and analytic systems by itself presents an undesirable challenge. And when integration of these point systems is added to the equation, the project becomes high-risk with low strategic value.

INTRODUCTION

From the perspective of today's business users, there is a growing demand for a single system that will address all of their business performance management requirements. Adding to the complexity, most organizations cannot afford to replace their existing infrastructure and therefore require solutions that work in conjunction with as many existing systems as possible. These requirements drive a new class of product with a unified Business Performance Management (BPM) architecture.

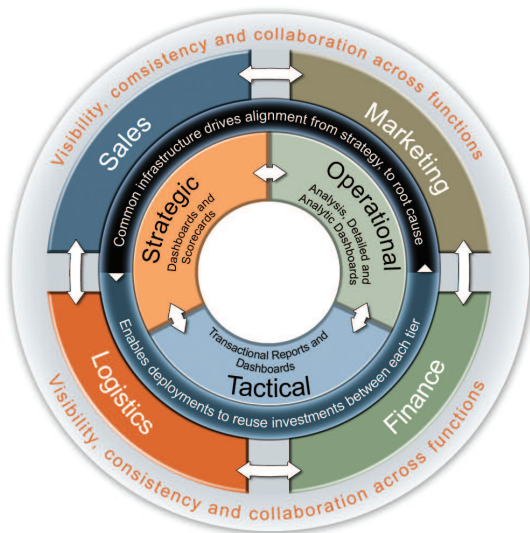
This emerging market is primarily being driven by the need to progress from tactically responsive analysis towards a more strategic, proactive perspective. It is no longer sufficient to simply report results that are not tied to strategic objectives or business plans, nor is it efficient to have to scramble to search through the vast collections of data sources to collect a relatively small amount of critical information required to support a business decision. Enterprises need to link their strategic objectives with operational goals, across the entire breadth of the organization. To implement



This new class of product is referred to as a unified business performance management (BPM) system. It is rooted in the evolution of business intelligence, financial applications, and desktop technologies.

HYPERION SYSTEM 9

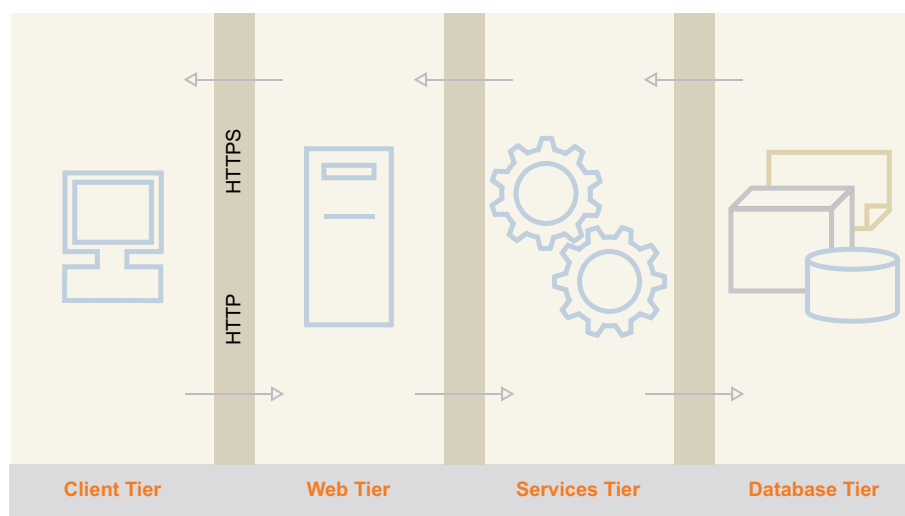
this, corporations must report on and analyze both financial and non-financial information in a highly coordinated fashion. This would allow corporations to monitor and compare performance to plans, adjust plans to respond to changes in the business landscape, and to perform advanced planning by modeling potential scenarios.



A unified BPM system enables this movement to strategic cyclical analysis by integrating a Business Intelligence platform with a suite of financial applications to deliver these tightly integrated capabilities to the business user.

The IT community is tasked with serving their customers’ needs and in order to ensure reliability and scalability the technology they deploy must be built on modern IT architecture standards. The current generally accepted standard used to meet these needs is a services oriented architecture (SOA). While there are varying implementation definitions of an SOA, at its core it is a set of design practices for building software where functionality is implemented as a collection of independent services and an established communication mechanism exists between these services. This enables all of the components in a complex IT infrastructure to interoperate quite easily and efficiently, and significantly reduces the time and effort for systems to be integrated. This also happens to be one of the key mandates of a unified analytical system.

Beyond this, IT organizations are looking to maximize value from a smaller set of trusted vendor partners, thereby lowering their Total Cost of Ownership (TCO). This value is magnified by addressing preexisting pains associated with deploying multiple, disparate reporting and analysis tools, as well as various packaged analytical applications. As these have proliferated throughout the enterprise with varied degrees of planning and centralized control, IT has been left to manage multiple vendors, installation processes, hardware, operating systems, and user interfaces. A unified BPM system architecture addresses all of these points in a significant way.



Hyperion System 9 Architecture

HYPERION SYSTEM 9

HYPERION SYSTEM 9

Since defining the Business Performance Management (BPM) category in 2003, Hyperion Solutions has been continually evolving our product line towards a unified Business Performance Management System. Today, that unified Business Performance Management System is unveiled as Hyperion System 9.

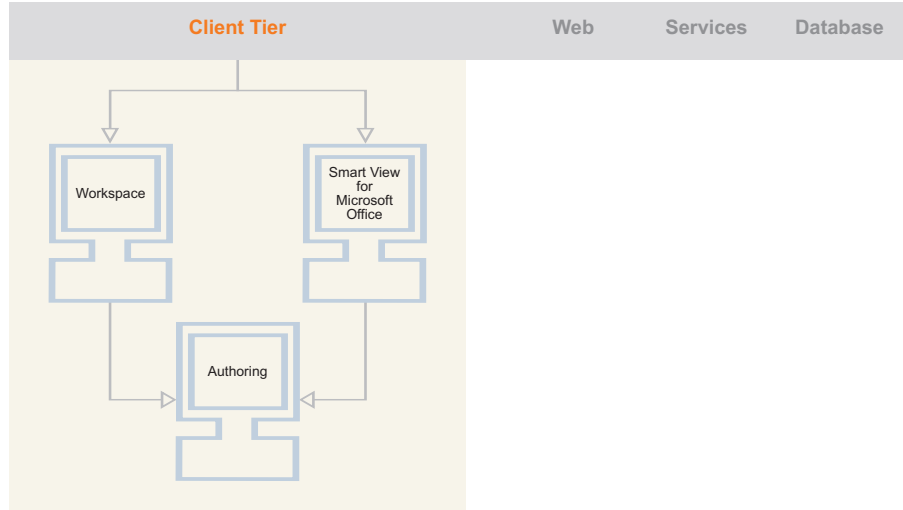
Hyperion System 9 brings together Hyperion's powerful business intelligence platform with its suite of market-leading financial applications as the first truly integrated BPM system. It has been designed and constructed utilizing a modern, n-tier, SOA. The Hyperion System 9 SOA adheres to the key design principles that define an SOA, and has been optimized to achieve platform independence, massive scalability, and very high performance.

SOA has been used internally by Hyperion products for many years. As an example, Essbase Deployment Services (which first shipped in 2001) had a fully fledged Web Services layer that was used for internal communication with several of our reporting front-ends. Hyperion was also a pioneer in its support for open, XML-based web services standards to analytical servers by supporting the XML for Analysis standard along with Microsoft and SAS, and the

JOLAP Standard with Oracle. Hyperion Performance Suite (first shipped in 2002) was also built around SOA principles and a highly scalable distributed architecture. Our experience and best practices in building SOA compliant systems have been carried forward into the design and construction of Hyperion System 9.

Other technological innovations being driven by Hyperion include the incorporation of XBRL (eXtensible Business Reporting Language) output into our financial reporting capabilities. XBRL is an open-standard XML based extension for financial reporting and has been embraced by more than 200 companies, software vendors, and government organizations. Regulators such as the US Securities and Exchange Commission (SEC) and Federal Deposit Insurance Corporation (FDIC) have embraced XBRL as a standard for financial data interchange. By supporting this standard, Hyperion can provide, in essence, a statutory reporting service to every external consumer of an organization.

Conceptually, the Hyperion System 9 architecture consists of four processing tiers: Client, Web, Services, and Data. In the following text, we'll explore each tier and the role it plays within the architecture.



Hyperion System 9 Client Tier

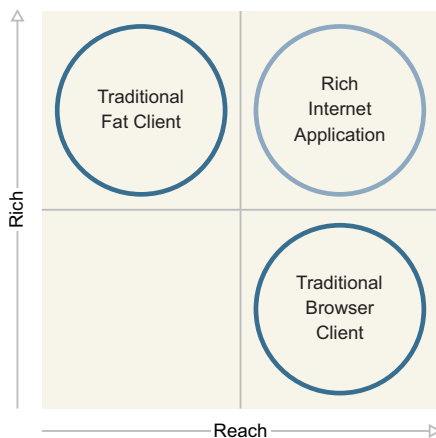
CLIENT TIER

The client tier consists of three main components: the Hyperion System 9 Workspace, Authoring Studios, and Smart View for Office.

The Hyperion System 9 Workspace is a rich, zero-foot-print user environment delivered via DHTML. It provides business users with a single point of access to all of their BPM content. The design of the user interface is striking in its simplicity and aesthetic appeal. A context-sensitive view pane and toolbar understand the nature of the business content being presented—they automatically adjust to present options that assist the user in navigating and working with their information.

The Hyperion System 9 Workspace runs in industry-standard browsers with no desktop setup required, mini-

mizing the maintenance effort from IT. It was developed using a new paradigm in Web application development – AJAX (Asynchronous JavaScript and XML). AJAX is a set of mature technologies that have come together in a powerful new way, incorporating DHTML, CSS, and manipulation of the browser’s document object model (DOM), along with asynchronous communications between the browser and the server using standardized XML objects. Through the use of an AJAX engine, the rendering of the user interface and communications with the server become two separate functions, removing the need to reload the entire page when new content is required, significantly improving the responsiveness (and usability) of the system.



Rich Internet Applications combine the modern desktop-like interface of PC programs with the reach of Internet-based architecture. Google has made a large investment in the Ajax approach – Gmail, Google Suggest, and Google Maps are all AJAX applications. Flickr and Amazon’s A9 search engine leverage AJAX techniques. For anyone who has experienced the frustration of waiting for a simple web page to repaint yet again, the rich interaction and responsiveness that Ajax applications provide are a considerable step forward in Web application design. Business 2.0 magazine (October 2004) selected Rich Internet Applications as one of the ten technologies to watch in 2005.

Source: Gartner Research (May 2005)



To ensure that the design of the Hyperion System 9 Workspace was compelling and dynamic, Hyperion partnered with creative thought leader, frog design. This global organization began with industrial design and has broadened its expertise into brand, strategy, and digital media. They were a key contributor to the Microsoft Windows XP and Apple Macintosh design efforts.



CLIENT TIER

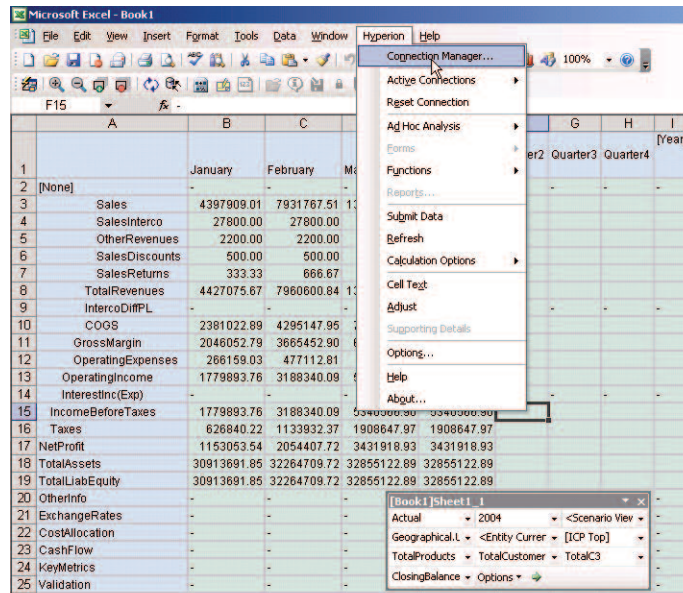
To provide a consistent user experience across Hyperion System 9 modules, Hyperion has employed an object-oriented component framework for construction of the System 9 Workspace. MB Technologies' Bindows is the leading Software Development Kit (SDK) used for developing zero-footprint SOA client-side applications. It contains a complete windowing system with a wide array of supported tools including menus, forms, grids, sliders, and gauges that allow Hyperion development resources to spend more time building BPM systems and less time building user interfaces.

The Hyperion System 9 Workspace incorporates a “business process-based personalization,” which is fully customizable based on individual or group needs. This creates a user-centric experience rather than a product-centric one. Common tasks are presented in a task-oriented workflow view to guide business users through the process of discovering patterns, creating reusable analytical content

and performing ongoing collaborative analyses. Efficiencies are achieved quickly. Novice users are provided an easy path through the system, while being shielded from the need to understand the complex aspects of the data source(s) they’re accessing.

The “folder-like” file system paradigm for directory access makes it easy to search for, view, and interact with any document available to the user. This includes both Hyperion created content as well as standard business content created in Microsoft Office and other business productivity software. For those users with the need to perform their work offline, Hyperion System 9 also includes capabilities for high-performance offline access and analysis.

The HS9 workspace offers a highly interactive user experience that will appeal to users who expect sophisticated interfaces to be both compelling to use and easy to understand.



Hyperion System 9 Smart View for Excel

CLIENT TIER

Hyperion System 9 includes expert authoring capabilities. This comprehensive report development environment delivers a wide breadth of functionality based on business requirements, the nature of the data being accessed, and the desired output format. Since Hyperion System 9 is a truly integrated system, all System 9 financial applications can take advantage of these powerful reporting capabilities.

Hyperion System 9 BI+ Web tier-reporting modules are responsible for final formatting of content provided by the services tier:

Production Reporting Module—design and generation of high-volume, pixel-perfect production reports

Financial Reporting module—creation of highly formatted financial statements and report books in multiple output formats

Interactive Reporting Module—construction of ad hoc queries and visualization of both relational and multi-dimensional data

Web Analytics Module—intuitive, graphical analysis across Hyperion applications and Analytics engine

Enterprise Metrics Module—cataloguing, presentation, and analysis of the metrics that drive your business

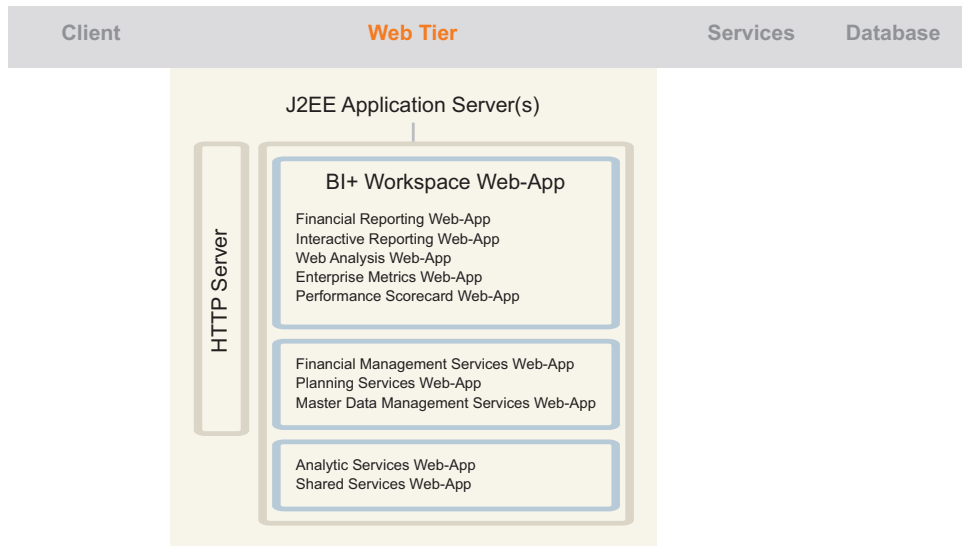
Hyperion System 9 Smart View for Office is a single Microsoft Office add-in that allows business users to work directly in the Office environment (Excel, Word, PowerPoint, Outlook) while interacting live with their

Hyperion BPM content. This capability supports both pulling content from Hyperion System 9 into the Microsoft Office environment as well as pushing BPM content into the individual components for further presentation customization.

The technology behind Smart View for Microsoft Office builds on years of Hyperion’s expertise and excellence with Microsoft Office integration. As shown in the graphic, the business user launches any Microsoft Office product (e.g., PowerPoint) and establishes a connection to the appropriate data source provider via the Connection Manager drop-down menu. Once a connection has been established and security validated, the user can immediately navigate and embed System 9 content.

Smart View supports Microsoft Office SmartTags. Hyperion BPM content exported into Microsoft Office moves as fully formatted reports to deliver a high fidelity representation of the original, including fonts, colors, spacing, borders, etc. For example, you can drop a chart directly into a PowerPoint presentation and have it update automatically as the data is refreshed. Totals and other calculations are mapped into Excel formulas rather than static numbers.

One key use of the Smart View technology is the ability to create data entry forms that allow users to write back to an analytical database, typically to perform scenario modeling (under the same robust security model used in other Hyperion applications).



Hyperion System 9 Web Tier

WEB TIER

There is a large community of business users who are very comfortable with Microsoft Office, and would prefer to continue working in that environment. When speed of deployment into a Microsoft environment is a high priority, organizations can minimize the training effort, accelerate adoption, and capitalize on existing skill sets by leveraging this capability.

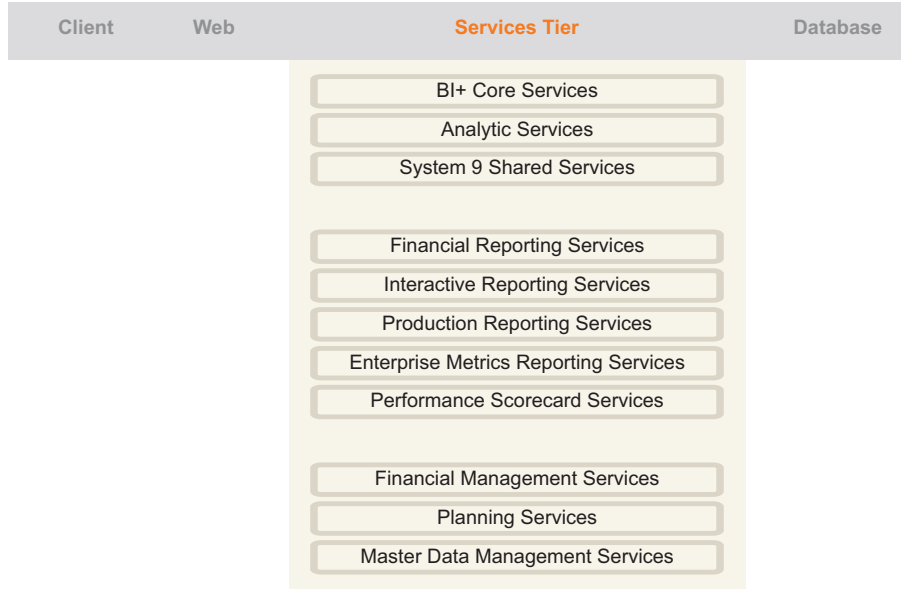
WEB TIER

The Hyperion System 9 architecture leverages industry-standard Java 2 Enterprise Edition (J2EE) Web application servers, such as BEA WebLogic and IBM WebSphere, as well as open source servers like Apache Tomcat. This functionality allows System 9 to automatically inherit the highly scalable Web-oriented capabilities built into these technologies, such as fault tolerance, rapid deployment, clustering, and failover.

The System 9 Web tier leverages the J2EE application server environment and consists of a collection of Web applications constructed as servlets and jsp pages. These purpose-oriented Web applications incorporate logic specific to the type of BPM functionality to be delivered.

Hyperion System 9 Master Data Management (MDM) ensures consistency of all master data and data structures across BPM environments of all sizes, eliminating costly manual master data management processes. It supports SOAP/XML via Web Services, integrating BPM master data changes into lights-out maintenance and integration processes. The MDM Server was architected to enable “point and sync” Business Performance Management master data. Hierarchies, such as charts of accounts, financial, sales and locations, as well as organizational changes and new products, are quickly and automatically synchronized between individual transactional and analytical systems. This capability results in unparalleled accuracy and consistency of data and data structures across all IT systems.

In front of the Web tier, an HTTP server manages communications between the client tier and the Web applications and acts as a proxy to multiple application servers. The Web applications assemble the responses to be returned to the client, making calls to the back-end services for the discrete units of work to be performed. The Web tier manages brokering of requests to the appropriate and distributed set of services.



Hyperion System 9 Services Tier

SERVICES TIER

Service-Oriented Architecture is a set of software design principles that states that software components be designed as independent services with clear interface boundaries that do not rely on the state of other services. As mentioned earlier, SOA is not a product; rather, it is a style, or set of practices for building software. It is the design philosophy behind all Hyperion products.

The Hyperion System 9 architecture exemplifies an SOA by adhering to the following design principles:

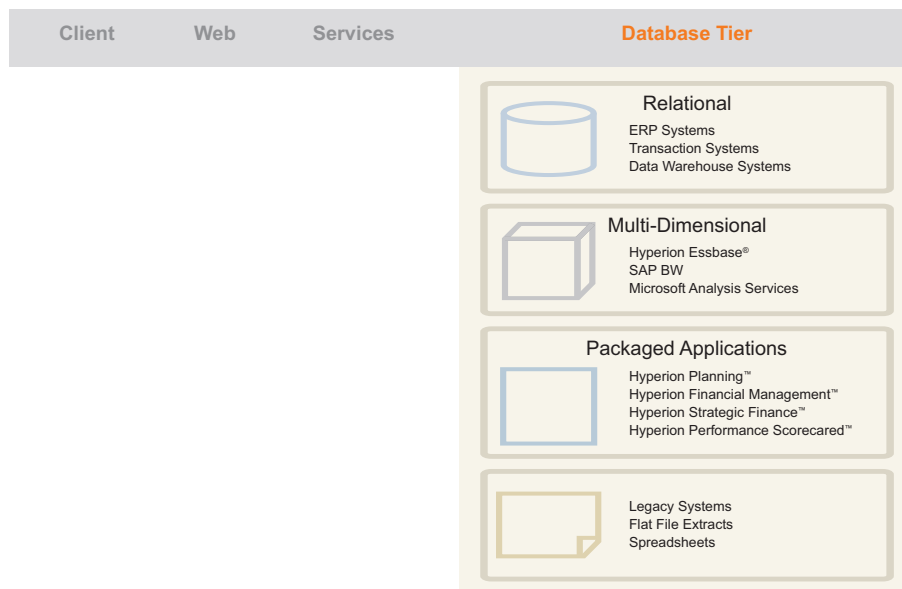
- Individual Services perform singular, cohesive sets of functionality
- Minimal connections between the services, with minimal communications roundtrips
- Each Service operates independently of all others
- Better performance when deployed in a multi-system configuration

The scalability requirements for an enterprise business performance management deployment call for a highly distributable solution where multiple physical servers comprise the production deployment environment. This distribution of services provides isolation, fault tolerance, and expanded scalability capacity by simply adding services to the solution. While enterprise deployments are typically organized in a multi-server distributed manner, the service-oriented nature additionally supports some or all services

running on a single physical box for smaller deployments. The manifestation of an SOA within Hyperion System 9 means that organizations can be confident in their ability to grow their user community, increase their data volumes, and add new applications.

The BI+ Core Services are a collection of services that manage the general infrastructure of Hyperion System 9. These include replicable services, such as authorization, authentication, session management, usage, and logging. A CORBA-based framework for communications manages interactions between the distributed computing services. A single point of administration controls users and security, while leveraging your existing LDAP, NTLM, Netegrity SiteMinder, or Microsoft Active Directory repository to provision BPM users. Managing a single user ID across all BPM applications means greatly reduced administration for IT, and only one password to remember for the business user.

Other BI+ Core services include the event service and repository service. Hyperion System 9 has been architected with a common repository that houses all document objects accessible by business users, both Hyperion content as well as generic, non-Hyperion created content. The repository service manages the content, while the event service triggers the subscription notifications to alert users of updated content being made available and manages the externally triggered events for running scheduled jobs.



Hyperion System 9 Database Tier

DATABASE TIER

Services across the financial applications incorporate the financial intelligence gleaned from input from thousands of customers who have deployed our financial applications within their organization.

The services that deliver specialized BPM functionality are purpose-built to provide the content for analytic, reporting, application, and data access capabilities of Hyperion System 9. These functionalities include the Financial Reporting Service for producing financial-oriented report data, the Production Reporting service for delivering pixel-perfect operational report content, the Data Access Service used by the Interactive Reporting module for access to relational databases, the Interactive Reporting Service for managing the dashboards, queries, pivots, charts, and management reports, and the sophisticated Web Analysis service for navigating OLAP data.

A specialized set of services has been incorporated within the Interactive Reporting module called “Impact Manager.” These services allow for the detection of changes in a data model and then the automatic propagation of updates to documents where this data model is in use. This capability significantly lowers the cost of monitoring and managing inevitable business system changes.

DATABASE TIER

Hyperion System 9 unifies reporting, query, and analysis, as well as seeding financial applications, across a wide range of data sources. As the various System 9 services require access

to one or more databases to execute queries and retrieve results, the most appropriate communications protocols are used based on data source, e.g., MDX, BAPIs, JDBC, and OCI.

The service-oriented architecture makes for a very straightforward set of options when configuring a deployment topology. As more users are added to the system, more services to access the databases can simply be installed on additional pieces of hardware in order to increase scalability. Additionally, services can be assigned specific affinity for accessing particular data sources, which allows for the further segmentation of the computing resources to match user demands and other service level agreements.

Hyperion System 9 supports access to wide variety of relational, legacy, and multidimensional sources. For example, it has been optimized for access to SAP BW. Direct BAPI access to SAP BW facilitates financial reporting, production reporting, and ad-hoc analysis of SAP BW data. A key strength of Hyperion System 9 is its ability to blend SAP BW and relational data in the System 9 Workspace.

Hyperion System 9 Applications leverage the appropriate database technology to deliver the requisite business functionality required by the application. For example, Hyperion Planning exploits a multidimensional data structure to store its data in order to optimize the write back and business rules capabilities required by planning users, whereas metadata and annotations are stored in a relational database.

**SUMMARY: A UNIFIED BPM SYSTEM THAT
LOWERS TOTAL COST OF OWNERSHIP**

As companies strive to better manage their expense line, IT is looking to lower the TCO of all managed systems. Hyperion System 9 delivers on this objective in the following ways:

1) Hyperion System 9 is a unified approach to BPM, incorporating functional breadth in both BI Tools and Financial Applications—all in one product set. With one system to license and one vendor to partner with, you address all of your Business Performance Management needs driving lower TCO.

2) Hyperion System 9 is built using SOA principles and modern technologies, such as DHTML, CSS, XML, JavaScript, and J2EE. It embraces the Rich Internet Application paradigm by leveraging AJAX techniques, offers an unparalleled user experience, and conforms to the demanding standards set by today's IT organizations.

3) Hyperion System 9 can start small and grow with your analytical requirements, or be rapidly scaled enterprise-wide. Our "start anywhere" philosophy allows companies to prioritize their needs, install only the services necessary, and then deploy solutions as required, while our multi-tier architecture allows for very advanced deployments.

4) Hyperion System 9 is easy to use, manage, and maintain. Because of its common look and feel, you need only train your users once, and they can quickly come up to speed as new applications come on stream. Central points of administration ease the burden on IT.

What this means to IT organizations is a "deploy once" approach. With Hyperion's flexible e-Licensing model, you buy what you need and the system will track what you use. In today's regulatory environment, this capability eases the effort to adhere to Sarbanes-Oxley requirements. Since Hyperion's SOA is constructed of loosely coupled, stateless components, they can be mixed and matched as needed and purchased in any order. These services can be installed on separate pieces of hardware and replicated to meet the demands of an enterprise-wide user community. Hyperion System 9 pricing and packaging allows customers to buy the modular services they need to meet their current business requirements, and plug in additional modules as new requirements arise.

Today's business users are asking for a whole lot more from their Business Performance Management systems. From dashboards to scorecards, from production reporting to ad-hoc analysis, and from financial applications to Key Performance Indicators, it's clear that businesses want one system that offers broad and diverse functionality. They want the interface to be intuitive and easy to use, and they want the system to integrate with their Microsoft Office productivity tools.

That Unified Business Performance Management system is System 9—from Hyperion.

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