

Building a Business Intelligence Portal

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INTRODUCTION

Business intelligence today (Q4, 2002) is a high-growth industry, and a great deal of effort and expense is involved in building BI systems.

Data volumes are growing, and seeking information from that data is of great importance to any organization, many of which are seeking a competitive advantage from the data that they are gathering.

A BI portal is seen as the solution to this problem.

The business intelligence industry is coalescing very much like other major mature industries, – such as the automotive industry and the retail industry – into a smaller number of larger vendors. These are the points that we'll drill down into in this presentation.

Welcome to this WatchIT Core Technologies program, Building a Business Intelligence Portal.

I'm Steve Illingworth, and I'm a senior director of business intelligence products at Oracle Corporation headquarters in Redwood Shores, California.

I have been with Oracle for 11 years now, and in the industry for a total of 17 years; so as you can imagine, I've seen some significant changes evolve in that period of time.

Oracle, for those who don't know, is the second-largest software company in the world, and the largest enterprise software company, having some 42,000 employees and more than 10 billion U.S. dollars per year in revenue.

Apart from the well-known Oracle database, the company also has software for:

~ Building business intelligence solutions;

- ~ Software for developing applications; and
- ~ An industry-leading application suite in the ERP/CRM space that was built using those core products.

AGENDA

Let's have a look at our agenda for today.

- ~ We'll start off by defining and talking about the implementation of a BI portal;
- ~ We'll look at the goals of a BI portal from the user perspective; and
- ~ How a BI portal actually delivers the information that people need to do their day-to-day jobs;
- ~ We'll look at what a BI portal should deliver, not just from the user perspective, but also from a technology perspective – and how we can roll this out to large organizations;
- ~ We'll also look at the roles and responsibilities of a BI portal development team;
- ~ We'll finish by summarizing the whole of this presentation.

PROGRAM ROI

Oracle has been deeply involved for many years in helping to implement BI solutions at Fortune 1,000 companies. And, we hope to transfer our experience and knowledge and demonstrate some proven techniques in building complex business intelligence solutions.

By watching this program you will learn:

- ~ The pitfalls and the problems in building a BI portal, as well as
- ~ The advantages and disadvantages of the various solutions that are available.

As you implement the ideas discussed, you will save both time and money when building your organization's business intelligence portal.

ADDITIONAL EXPERTISE FEATURED IN THIS PROGRAM

We'll also speak with Matt Rhoades, who's the team leader for advanced technologies at Henkel Consumer Adhesives in Avon, Ohio. His team has built a business intelligence portal that is now deployed production.

VALUE-ADDED RESOURCES INCLUDED WITH THIS PROGRAM

If you are viewing this program via the Internet or on CD-ROM, you'll have access to:

- ~ The program transcript;
- ~ A glossary of terms; and
- ~ Links to related Web sites, key documents, recommended books, articles and relevant vendor information.

All of these enhancements add to the learning experience.

DEFINITION AND IMPLEMENTATION OF A BI PORTAL

In this section, we'll present a definition and discuss implementation of a business intelligence portal.

Let's start with the definition. A BI portal is hosted on a server – is accessed by a Web browser – so it becomes an always-available Internet desktop, if you like.

It gives me access to business applications and information. The crucial difference between, say, a desktop on a Windows environment and a BI portal is the fact that it's customizable and personalizable, and available from anywhere I can gain access to a Web browser.

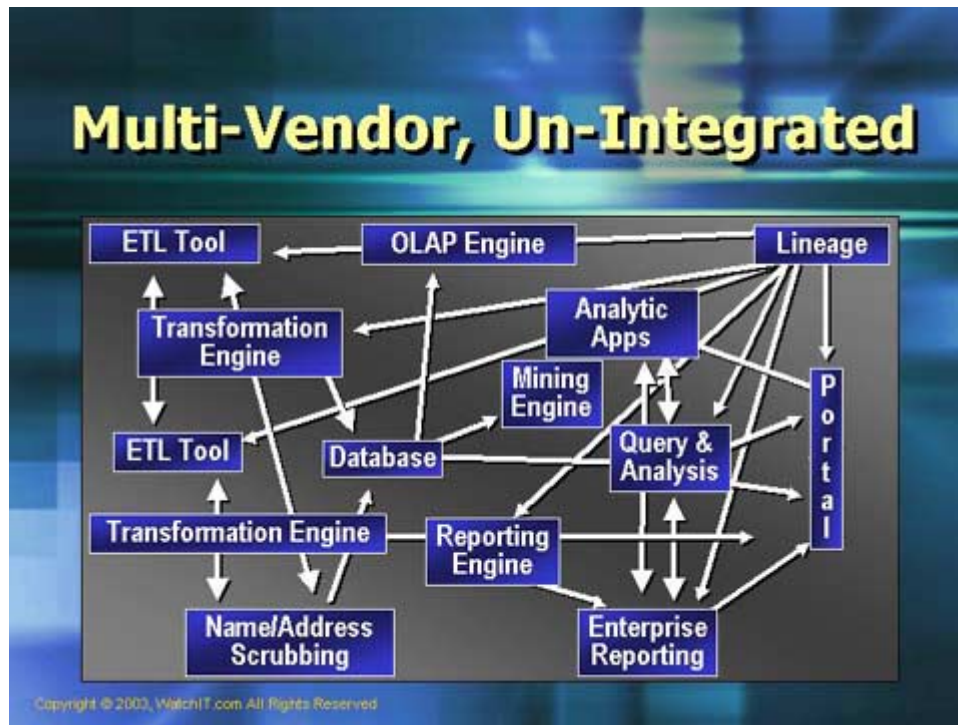
What the portal will do is give me integration of content. It will allow me to take content from various sources and give me a single view of that content on my Internet desktop.

Integration of Components Into a BI Portal Solution

Integrating the various components is where the complexity and the costs escalate. Consider the various components that could be in your BI portal solution.

Here we have just some of the components that could be available from several different vendors.

Figure 1



We have ETL tools – extraction, transformation, and loading tools – that have server-based functionality, as well as a user interface that's required to take data from several different data sources – perhaps your supply chain management (SCM) or your customer relationship management (CRM) or your financial application, as well as several different departmental applications.

Also you need multidimensional analysis – trending and forecasting on that data.

You need query and analysis tools that end users are going to use to access that data.

You need reporting tools that will do bursting and distribution of reports to senior management, all the way down to clerks in the financial departments.

BI Portal Integration Issues

Well, all of these are available from multiple vendors – but if we try and fit these together, then we're going to end up with protracted and complex implementation of a diverse set of technologies.

It's not just the implementation, it's the escalating maintenance cost of these technologies – and it can give us a poor and incomplete business intelligence solution.

Do we build any other complex system this way?

A car, for example: Do we go, when we build a car, to various different vendors, and buy an engine, and buy wheels, and buy a body, and buy all kinds of infrastructure and electronics for the car, take the whole thing home and then build it ourselves in a garage?

I guess some people do, but it's an expensive solution that takes a great deal of technical expertise – and you can't drive the solution for a long period of time.

Nowadays, we go out, we buy a car, and we have an instantaneous solution. And we may do some tuning on the car: we may add some extras or change the color slightly. But what I end up with is an instant solution from a single vendor.

So you need to ask the question first: Do you need a solution – or do you need a lifetime project for the IT infrastructure department? Because that's what a complex solution can become.

Integrated BI Portal Problem: Protracted and Complex Implementation

Let's drill to those three points that I highlighted.

We'll start with a protracted and complex implementation.

These products from various vendors were never made to work together. These companies do not have integrated development teams. They use different metadata. They use different security systems. They have different administration tools for their servers – and, indeed, you will end up with many servers in your application server environment.

They use a totally different user interface. So, it means that users need to be trained in several different technology tools – and this is what makes the implementation both complex and protracted.

Integrated BI Portal Problem: Escalating Maintenance Costs

Now, once you even get this system up and running, you then have escalating maintenance costs.

What happens when a new version of one of those components comes through the mail and lands on the IT department's desk?

Will it work with the other components? Is this version of this product certified to work with all of these other components?

What happens if one of these vendors goes out of business?

You remember earlier, I was emphasizing the point that this industry is coalescing into a smaller number of larger software companies. So, if one of the vendors goes out of business, how does this nonintegrated solution work now?

You can't just stagnate, because software systems will continuously evolve. The operating system will have to be upgraded.

The other versions' other software will work with that newer version of the operating system, but the one piece of software that is no longer available will not work with the newer versions of the operating system. So you're going to have to replace it eventually. This is going to involve significant expenditure.

Integrated BI Portal Problem: Poor and Incomplete BI Solution

I also emphasized the point that this could be a poor and incomplete BI solution.

Imagine the implementation time scales of putting such a complex solution together. Imagine the training costs for all of these diverse UIs.

Are you going to be able to take all of the users of the BI portal and train them in the many different versions of technology that are actually part of the solution?

What about the maintenance department looking after servers, and monitoring those servers using different pieces of the software?

What is the weak point for the scalability of this solution?

As your organization grows, will the BI portal be able to grow with them? Or, are you going to have to change software because it doesn't scale beyond a certain number of users or a certain amount of data?

What is the weak point for security? This is an incredible concern in this day and age, where we have to look at who's accessing the data and the type of reports that we can give to management for all kinds of reasons.

The bottom line here is that no product integration means lots and lots of duplication of efforts.

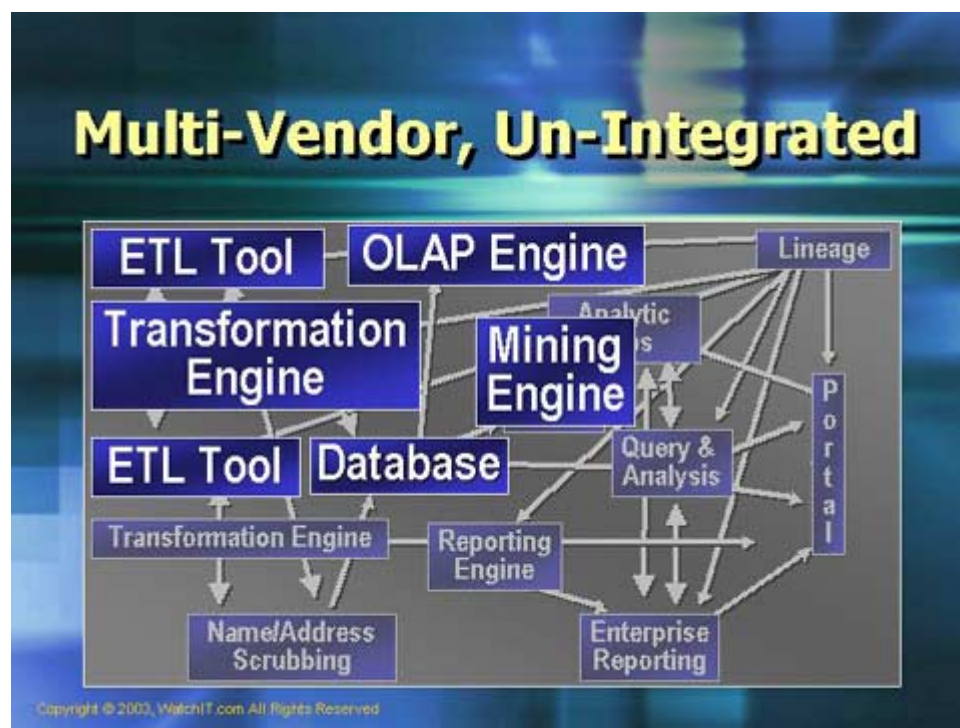
Finding Commonalities Among Unintegrated BI Solutions

So when we have an unintegrated solution, what we should be doing is looking for commonalities within these solutions.

Here, I've highlighted:

- ~ Some of the transformation functionality; and
- ~ The extraction transformation and loading tool, as well as
- ~ The OLAP engine; and
- ~ The data mining technology.

Figure 2



BI Portal Functionality

Well, all of this technology can actually be done inside a database. It's very process intensive, and over the last 20, 25 years, relational databases have been significantly enhanced to include some of this functionality.

Put this functionality as close to the data as possible – rather than taking a large data extract, hauling it across a network, and then trying to do the functionality to have a result set of maybe 40, or 50 rows.

So, instead of doing that, let's do the processing close to the data, and bring result sets of four or five rows back to the front end.

These sorts of functions really belong in the database engine – so part of your solution requires a database that is business intelligence focused.

BI Portal Integration

When we look at some of the other technologies that we need as part of our BI portal – so things such as:

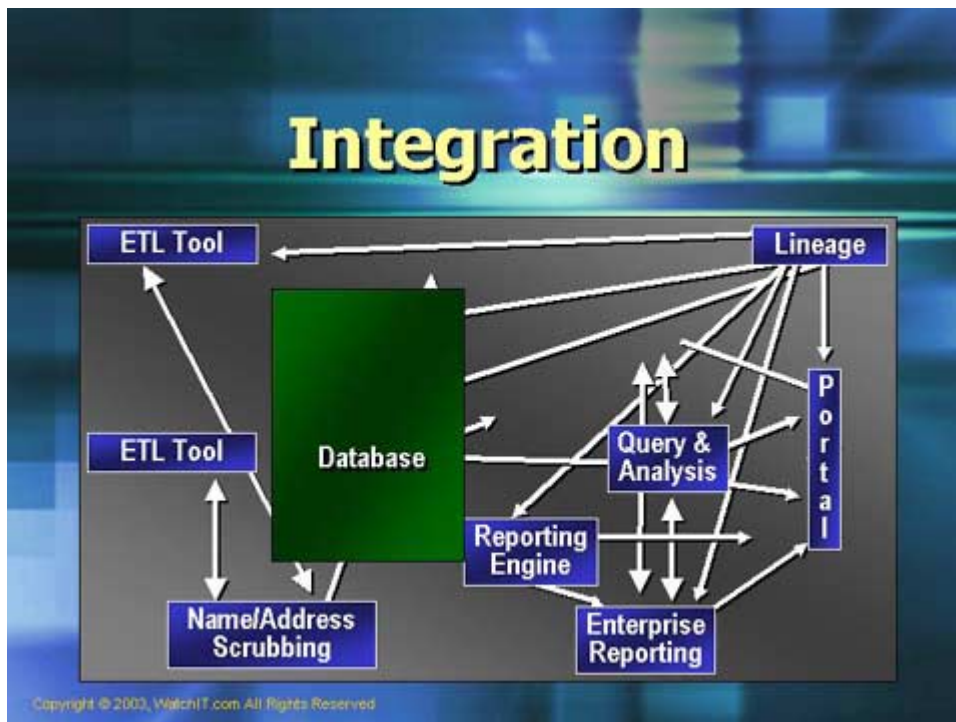
- ~ Query and analysis tools;
- ~ Reporting tools;

~ The user interface to my ETL tools; and again

~ Things like cleaning and lineage

... when we look at some of that functionality, as well as the portal itself, well, that really belongs on an application server, separate from the database.

Figure 3



Both of these solutions could be clustered. So, as my organization grows, I can grow the database by hosting it on several machines that work together as a single database, and then host my BI portal on another set of machines that also work together as a single application and access point.

So the:

- ~ Tools;
- ~ Applications; and the
- ~ Access point – the portal

... should all be hosted on an application server using the same management tools, the same security tools, and the same metadata for all of that functionality.

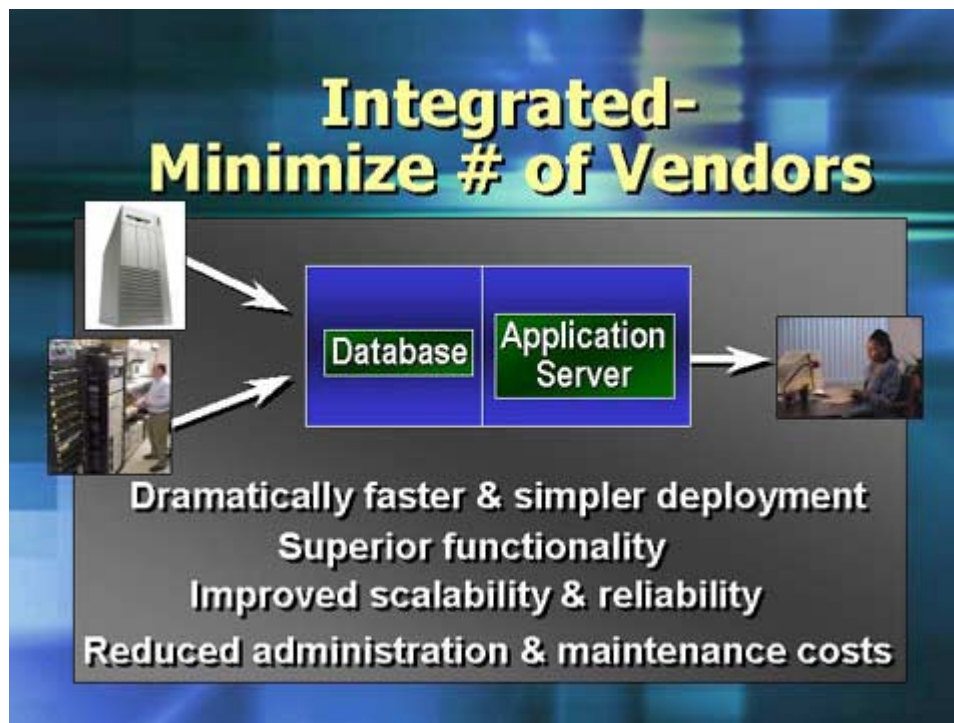
They should share many of the common functions, for instance, the graphical presentation of data in pie charts, bar charts and histograms.

What we need to do is integrate these technologies into two solutions instead of 22 solutions.

It would give us:

- ~ A dramatically faster and simpler deployment;
- ~ Superior functionality;
- ~ Improved scalability and reliability; and
- ~ It would significantly reduced administration and maintenance costs.

Figure 4



Now let's hear from Matt Rhoades on how Henkel used Oracle technology to implement their BI portal solution.

Matt Rhoades: Henkel's BI Portal Solution

We have several servers that all kind of talk to each other. We have our centralized data warehouse, and we have the portal solution, and then we have a broadcast agent server that goes out and runs reports, like static PDF-type reports and then FTPs them to the portal, that kind of thing.

And then from the notification standpoint, we have an e-mail server that notifies people that certain things are available, or that they need to do something.

So we do some custom Web development, as well, where we have workflow type applications that e-mail people when things need to happen.

And all those servers work together in a single environment.

Matt Rhoades: Henkel's BI Portal – Maintaining and Disseminating Information

We've seen huge advances in the ability to maintain and disseminate information through the portal. Because, again, you don't have to go in and maintain different applications on the user's desktop, you just simply point them to a Web address.

So, for instance, we developed some business intelligence applications for a company in Los Angeles that Henkel owns, and I simply had to point them to a Web address to get to that information. I didn't have to fly out there and install things and maintain that.

And as I develop more business intelligence applications for other companies within Henkel, it's just a matter of setting that user up on the portal and pointing them to a Web address.

So it greatly simplifies it.

And when you want to upgrade the application, you're doing it in one place – instead of having to go to 300 different machines to do that.

Matt Rhoades: Henkel's BI Portal – Oracle Drives Interoperability

We don't really have a lot of interoperability problems because we derive all of our business intelligence information out of a single data warehouse based on Oracle – and we use Oracle's portal solution to link into that data warehouse.

And Oracle's done a fantastic job in making that interoperability possible.

GOALS OF BI PORTALS

Steve Illingworth: What is it that we're hoping to achieve?

I've defined four pretty simple to state steps – but pretty hard to implement.

These steps are something that we should bear in mind as we develop and deploy the business intelligence portal.

Four Steps in Developing and Deploying the BI Portal

- ~ We need to get data into the database easily and quickly.
- ~ We need to be able to find information easily and quickly from the database that we've built.
- ~ We need to be able to communicate – easily and quickly – what we've found to a diverse population of users.
- ~ And, we also need to include business intelligence in the overall solution easily and quickly.

Perhaps we have just a business intelligence portal. But, more likely, we will have an enterprise wide portal that will give me access to applications, as well as to business intelligence.

So let's take those one at a time and look at those points.

BI Portal Step One: Get Data Into the Database Quickly and Easily – ETL

"Easily and quickly get data into the database" is very easy to state but is, perhaps, the single most difficult step to do.

I'm talking here about ETL technology – extraction, transformation, and loading of data.

This starts with the extraction of data from various sources – taking it out of our CRM systems, our ERP systems, our supply chain management systems.

So, we're taking the data from various data sources that could be in different databases, on different operating systems, in different file systems – perhaps some of it's in flat files – but taking that technology, transforming that data, to produce business intelligence data – so merging information about customers or about employees into a single set of data.

We're also looking at things like addresses and names: Are they misspelled? Is the company name exactly the same in one data source as it is in another data source?

And then finally, there's the loading of that data into what's going to become our data warehouse, our data mart, or the single point of entry for our business intelligence portal.

BI Portal Step One: Data Input – ETL Technology: Database Support

Well, does the ETL technology that you're choosing support the database of choice? So look at the database that you're using, and look at the functionality of that database. The many popular databases that are available today have some very powerful functionality embedded inside them.

I've detailed some here, such as:

- ~ Multitable inserts;
- ~ External tables;
- ~ Table functions;
- ~ Change data capture;
- ~ Resumable statements.

Does the ETL technology take advantage of the database technology, which now reflects 25 years of innovation?

It's been built to support large datasets in a business intelligence solution – so make sure that your ETL technology supports that functionality. It will make it significantly easier and significantly quicker to get the data sources into our finished database.

BI Portal Step One: Data Input – ETL Technology: Metadata Creation

Also, does my ETL tool support the creation of metadata?

This is the layer of data above my database; it's not just the table names, and the rows and columns within the tables. But does it support the business layer that users will use to access that data – where I talk more in terms of invoices and customers and suppliers and employees that a business user would understand?

Well, that metadata has to be created, and the time to do that is when you're extracting, transforming, and loading the data into the data warehouse.

So make sure the ETL technology that you're using supports the creation of metadata for the end user tools.

BI Portal Step One: Data Input – ETL Technology: Cube Creation

Does it also support the creation of cubes for multidimensional analysis?

This goes beyond the standard reporting that we need in query analysis tools. This is about trending and forecasting. If my sales, historically, in these past 18 quarters have been like this, what is it going to be like in the next quarter, and the quarter after?

So doing forecasting into the future requires more complex technology. Well, are the cubes for multidimensional analysis supported by the ETL tools?

BI Portal Step One: Data Input – ETL Technology: Admin and Security

What about administration – security management?

With the administration tools that you're using:

Can you give single sign-on (SSO) access to an individual user?

Can you allow a user to sign on just to the portal and to be able to access the ETL tool if they're an IT user?

Can they access the query and reporting tool if they're a BI analyst?

Can they access the reports if they're just an end user who needs to view data?

What about recovering data? What about restarting application service?

Do we need multiple administration tools or a single administration tool?

BI Portal Step One: Data Input – ETL Technology: Current Components

Finally, does the tool that I'm selecting support the generation of components that can plug in to my BI portal?

Are these tools aware of each other?

If they are, I'm going to save a lot of time and a lot of money in my overall BI solution.

BI Portal Step Two: Data Location – Ad Hoc Query Analysis

Let's also look at the ad hoc query and analysis technology.

This should also support the database functions.

Again, we're getting back to taking data from the database, hauling it across networks to application servers. Even hauling it across the buses on a single machine will take up extensive resources.

So, look for ad hoc query and analysis tools that support the functions of your database; things such as:

- ~ Ranking;
- ~ Aggregation;
- ~ Bucketing;
- ~ Statistical functions.

BI Portal Step Two: Data Location – Query and Analysis Technology Support

All of these have been added into database technology over the years so that people don't have to haul around huge amounts of data that can be involved in data warehousing or in data marts.

So, in your overall solution, does your query and analysis technology support the functions that the database gives you?

Does the query and analysis technology allow you to build a sophisticated report, so that a BI analyst, who understands the metadata can quickly and easily – using an easy-to-use user interface – build a report and then export it to reporting technology?

BI Portal Step Two: Data Location – Reporting Technologies

Reporting technology gives us such things as batch processing. And it runs on application servers.

It can give us sophisticated things such as report bursting, where I run the SQL query only once, bring back the datasets, and then can burst that out, and give several different views on the

datasets. And, I can have the report run at specific times of the day or night, so that I don't impact resources that may be in use during the standard eight-hour workday.

Again, do my reporting tools understand my portal?

Can I generate a report that was produced by the query and analysis tools, and then plug that into my BI portal? Or, am I going to have to roll up my sleeves and do extensive work in Java, so that I can take a report that was easy to produce and make it available to users?

BI Portal Step Two: Data Location – UI Look and Feel: Integrated Management

Look for the look and feel of these tools.

To a user, they're going to have a single access point, a BI portal. So what's it going to look like when they run a report from the reporting tool, and then jump out into the query and analysis tools?

~ Are the user interfaces totally different?

~ Are the navigation and the menus different from one tool to another?

~ Are the administration tools, to look after the applications servers, totally different?

If so, the IT department will have significant problems in maintaining this system. So look for integrated management tools for the middle-tier as well, for doing things such as:

~ User security;

~ Event monitoring; and

~ Looking at statistics of usage.

BI Portal Step Three: Communicate Findings Quickly, Easily, Widely

The next part is to be able to communicate easily and quickly what we've found.

Now, sometimes this is going to mean using reports that just plug into the BI portal – rather than training every single user to use a query and analysis tool.

What we'll do is use a sophisticated reporting tool, something like Oracle Reports or Crystal Reports Professional, for building a report.

It's done by the IT department, but the report can then be used by several employees across the organization on a daily, weekly or monthly basis. This is a sophisticated environment requiring a report server.

Does it give me the same look and feel as the other tools that I'm using? And, again, is the reporting tool integrated with my management tools for the middle-tier?

BI Portal Step Four: Integrate Into the Overall Solution – Development Environment

And the last part of building a BI solution for a portal is my development environment.

Is my development environment in Java knowledgeable about business intelligence?

Does it have reusable components that have been prebuilt for business intelligence?

For instance, at Oracle Corporation, our Java Development Environment was used to build some of the business intelligence functionality, so those are packaged as Business Intelligence Beans, and can be reused in the:

~ Java Development Environment, as well as being used in the:

~ OLAP environment; or in the

~ Query and analysis environment; and the

~ Reporting environment.

Does the Java Development Environment support database functions, again – so we can use the power of the database to do some of the work for us instead of rewriting all of that code in the front end?

Using enhanced SQL to do the coding for us makes my life easier as a Java developer.

BI Portal Step Four: Integrate Into the Overall Solution – Performance Features and Goals

So, including BI in your overall solution has to include such things as:

~ Pre-built BI components for my Java Development Environment;

~ A presentation and catalog folder component for the BI portal that I can just plug in;

~ The creation of cubes for OLAP – for online analytical processing: MOLAP, ROLAP, et cetera –the creation of cubes that allow me to do trending and forecasting;

And again I'm emphasizing:

~ The management of the middle tier as move forward: the maintenance side, which is where we'll save significant amounts of revenue and time.

Is all of this technology integrated with my business intelligence portal, which is going to be my user interface into our total BI solution?

Now let's hear from Matt Rhoades of Henkel on this subject, and the fact that he has Java application developers working on his BI portal solution team.

Matt Rhoades: Java Development and BI Portal Solutions

Well, actually, just recently, in the most recent version of Oracle Discoverer that came out, they put a lot of effort into making the Java version very, very similar to, or exactly like, the client version.

So, for instance, when we rolled out the Oracle Discoverer for the Web, we didn't have to retrain our users, because the Java version looks and acts just like the client version.

Well, the performance can be an issue, because you are dealing with a client version that goes out to a server and runs a query and pulls that information back. And then the work – the sorting, and the drill down, and things like that – that work is done on the client machine; where in a Java-based discoverer, the server is doing all the work.

So, basically, what you're doing is taking 20 client machines and putting all that work onto a single server.

So, you have to make sure that your cache size is very large. You have to have a lot of memory to support it – that kind of thing. Because, you could have 20 people running queries – and the server has to be able to have enough memory to sort that information, be able to drill down on the fly, and handle those users' requests.

Well, you have to look at who your users are, that's the biggest thing. You have to be able to satisfy a wide variety of users – everyone from executives down to an accounts payable clerk.

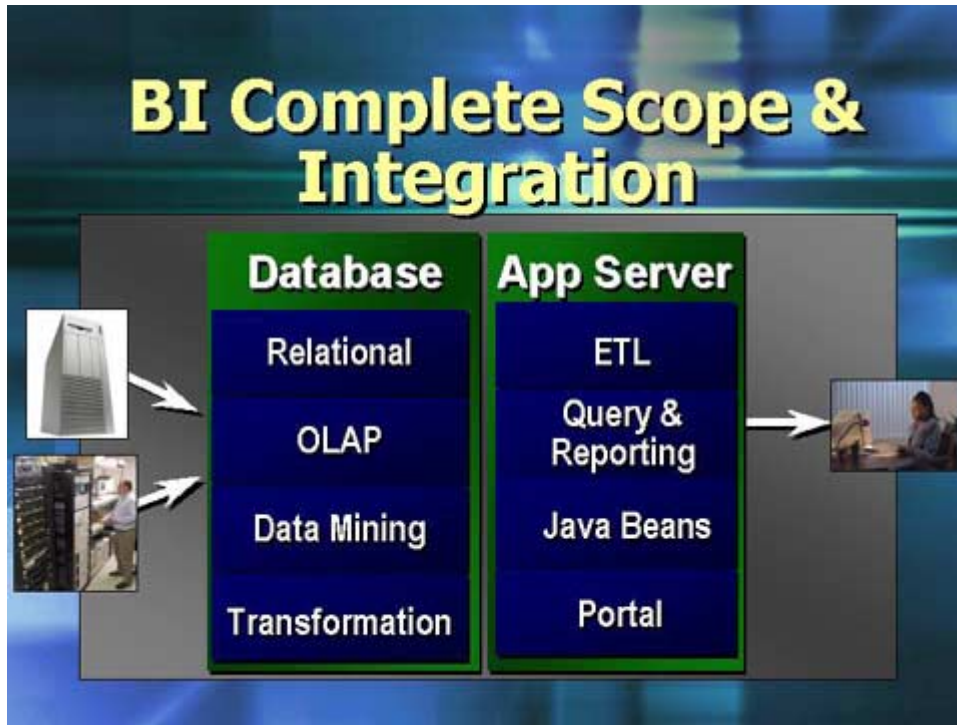
So, it's very important to do a lot of analysis to determine what you want on the executive level, and what you want to share with individual users.

And security is a big thing too, as well. Certain people can only see certain things, and you have to architect your portal solution so that you can maintain those users and have them view only the data that they can see.

Java Development and BI Portal Solution: Complete Scope and Integration

Steve Illingworth: So the right functions are in the right places. He has complete scope and integration with just a database and an application server for his BI solution.

Figure 5



DELIVERY OF INFORMATION VIA THE BUSINESS INTELLIGENCE PORTAL

In this section, we'll examine the delivery of information via our business intelligence portal.

So, we're talking here about the front-end interface to a very complex system. And when we say portal, we actually mean more than just portal technology.

Our BI solution consists of all of the complex technology that we've been talking about – and looking now purely at the delivery to a user.

BI Portal Information Delivery: Technology Requirements

The key thing is that this should give me unified access to all information that I require to do my day-to-day job.

It should be an open architecture, based upon standards, based upon portlets. These are pluggable components that can just plug into my portal.

So a portal solution will consist of many portlets. I, as an individual user, may only require a subset of those portlets, but all of our users together will require different small components for their particular solution.

It should give me simple access to information that's relevant to my particular role.

So the portal is personalized to the role that I fulfill, but it should give me automatic, federated access to all of the data sources that I need to do my job. The portal gives me the federated search across all data sources.

A portal should also give me the capability of publishing my own contents.

If I'm a business intelligence analyst, and I'm using a query and analysis tool to produce a report, I should be able to publish that report to relevant authorities, to relevant people within my department or the whole organization – and it should allow me to self-service publish.

The access controller should already exist. The necessary security should already exist – for me to be able to publish a report that I produced that other people could then automatically see.

So, do I have the ability in my query and analysis tool to publish a portlet that can be plugged into the portal, which then becomes available to the relevant users, who could then customize their portal to include that portlet?

Finally, the ability for a portal – which is an access point, remember – to deliver to any device: Can I deliver information from the portal not just to my browser on a PC, but, for instance, to the new generation of cell phones that give Web access and have a graphical user interface in color? Can I deliver information to a BlackBerry?

But can the portal, with one set of portlets, deliver to multiple devices? Or, do I actually need to develop different portlets for different devices?

If so, that's going to be a lot of duplication of effort. To develop one report for a PC, one report for a cell phone, and one report for any other device that needs to plug in, is not the way to go. That's the expensive option.

BI Portal Information Delivery: Open Portlet Architecture

So let's look at these items in a little bit more detail.

By an open portlet architecture, I mean following the standards as they're evolving at this time. As we move, this is going to give us significant capability to buy individual portlets off the shelf.

This may be a Yahoo search engine, for instance. Or, perhaps more than search engines, it will be business intelligence components that talk about post codes in the U.K., or that talk about zip codes in the U.S. So, I want to be able to buy business intelligence portlets that can plug into my solution without having to develop them myself.

So, a library of portlets that will plug in to my solution would only be available from multiple vendors if I'm following open standards.

If I'm following a standard from a single vendor, then this functionality would only be available from that vendor, or anybody that they could convince to follow their closed standard.

Historically, open standards will give us a lot more choice.

BI Portal Information Delivery: Simple Access to Relevant Information

Simple access to relevant information by role-based personalization: by this I mean a single sign-on architecture. I come to the URL for the BI portal, I sign on with my username and my password, and I see my business intelligence portal:

- ~ The reports;
- ~ The query and analysis environment;
- ~ The data mining environment; and
- ... any other components that I need to fulfill my role on a day-to-day basis.

Somebody from the sales organization may have a completely different view – but from the same URL. That's what a BI portal is about.

- ~ You fire up your Web browser;
- ~ You go to a single URL;
- ~ You sign on

... and then the appropriate portlets are dynamically plugged into your user interface for you to do your job.

BI Portal Information Delivery: Self-Service Publishing Within a BI Portal

The self-service publishing should be through that same browser, not a new suite of tools.

So, again, my publishing should be part of the portal solution, part of the portal technology – simple, browser-based tools that allow me to drag content that I've produced.

It could, perhaps, be:

- ~ Excel spreadsheets; or
- ~ Word documents;
- ~ It could be a report;
- ~ It could be a complex drill down into a multidimensional cube.

But can I pick up that content, drop it into the portal library, and make it available to any user who's also accessing the portal – if they have the proper privileges and the proper security?

Do I have access to templates, so that when I build my portlet it will look and feel like every other portlet on the Web – and not like something that I build with some extremely strange colors and flashing fonts that perhaps somebody else would not even be able to tolerate?

Do I have flexible content, taxonomy and attribution? Do I have the ability to be able to take all different types of content – images, Word documents and Excel spreadsheets, as well as the business intelligence components – and add them to that portal library?

You also want managed delegation: the ability for administrators of the portal to create workflow based approval.

So, if I produce a complex report that is going to be resource intensive, the portal would know about this – and workflow would kick in to get the proper authorization, the proper approvals, for that content, that portlet, to be able to be published into a list of people to use.

BI Portal Information Delivery: Staying Up to Date to Ensure Availability

And, the last part that we feel is very important is staying up to date with evolving technology.

Figure 6



If you're going to build a business intelligence portal, then ensure that it will be available to any device; that you develop one single portlet for multiple devices, and not develop – even using open standards – where you have to develop a portlet for a PC browser, a separate one for a cell phone, a separate one for a BlackBerry.

You need to develop one portlet that can go out to multiple, different devices. The portal should understand the device technology, not the individual portlets.

WHAT SHOULD A BI PORTAL DELIVER?

In this section, we'll describe what the BI portal should deliver.

This is more than just from a user perspective, but let's start off with: a business intelligence portal should be the front end to a set of common, distributed-but-interconnected business intelligence services.

This architecture promotes scalability and fault tolerance with a common user interface.

Again, I'm emphasizing the point of minimizing the number of vendors that you work with.

We should have a single, unified point of entry – all users go through this point – so there's no need to build menus, and to administer multiple entry points.

BI Portal Ingredients: Common BI Documents

There should be a common business intelligence document, or documents – or at least a portion of that document, which is what eventually produces the reports or workbook – and I should see that document in my BI portal.

The option, then, is that I click on that document and I see the whole report. Or, I click on that document and it powers up the business intelligence application that resides behind it.

Perhaps it's the built-in Java; perhaps it's the reporting tool; perhaps it's the ETL tool. But this single point should give me access to all of this.

And I should also have access to common metadata definition, not have metadata for individual tools. You can see how that would produce an extensive amount of duplication.

I should be able to do intelligent stuff with this document; so not just see it, but actually drill down, or maybe pivot, on the document to get more detail.

Rather than providing a single document that tries to show 400 columns and 10 million rows, perhaps it's just the aggregation of the data. And when I drill on a single cell, I see how that cell was produced, and I see another report underneath it.

That's how a BI portal should be delivered to me.

BI Portal Ingredients: Common Security Server

It should have a common security server. This is about promoting single sign-on.

I'm sure all of us already have too many user names and logons to various systems, so the last thing I need in a BI portal is that every time I click on a portlet, I have to sign on again.

I should be able to sign on once to the business intelligence portal, and everything that happens beyond that point – whether I'm running reports, whether I'm doing query and analysis, whether I'm doing the ETL work at the IT level – should be automatically signed on to the application using a single sign-on server.

BI Portal Ingredients: Aggregation Engines

Aggregation engines, when they formulate those results, can be very, very intensive SQL – taking up a lot of CPU time, a lot of resources. You don't want to throw it away because somebody flips to a different tool. So, for instance, when I export from my query and analysis tool into my reporting tool:

- ~ Is the aggregate data still usable?
- ~ Is it still available to my reporting tool?
- ~ Or, do we have to run the whole SQL query again?

BI Portal Ingredients: Pluggable Architecture for Services

Services should have a pluggable architecture – in other words, the functionality can be extended.

So, in my reporting tool, how integrated am I with my Java Development Environment? So that I can go out and build something sophisticated, a very sophisticated BI application that maybe does something on a flat file system that the BI tools don't work with.

Can I integrate that into my whole environment?

BI Portal Ingredients: Common Administration Service

Finally, there should be emphasis on a common administration service.

We're going to have in our BI portal solution, application service for query and analysis, and for reporting. We're going to have a database in this architecture.

This is server technology that needs to be administered. It needs to be tuned. It needs to be monitored.

I've got to look at the health of the system and find out where problems are.

I don't need 20 different administration tools to do this. I should minimize those down to one, in the best case. The minimum number of tools I'm using, the easier it is to maintain this system.

Benefits and Limitations of a BI Portal

The benefit of this is a single, unified location for all the content aggregation.

But there are some limits that we have to be aware of when we build a BI portal solution.

Not everything can be housed within a single portal application. I can't build one single window and then through that do everything that every single BI user would want to do.

Sometimes you have to drill out into a particular application.

This could simply be because of the real estate on the screen. I don't want the other portlets visible when I view a particular report; I want the whole screen dedicated to that report.

It could also be tool implementation. Some sophisticated user interfaces – those, for instance, that require me to drill and forecast and produce charts on more complex data – may need a Java UI to be effective, and this may not plug into the portal.

So, evaluate, right at the start, what you can do within the portal, and where you will need to switch out – because it is a limitation of current portal technology.

ROLES AND RESPONSIBILITIES OF A BI PORTAL DEVELOPMENT TEAM

In this section, we're going to describe the roles and responsibilities of a BI portal development team.

The Role of the BI Portal Administrator

The first person I'm going to highlight is a portal administrator.

This is somebody who's going to be the security expert for our portal. They will make the services available within the portal. This really needs to be an IT professional.

We talked earlier about all of these different portlets that are going to be part of our BI portal solution – and for my role, I need a subset of those portlets.

Well, this needs an administrator:

- ~ To create the roles; and
- ~ To create the groups; and then
- ~ To administer the security levels

... so that I, as a user, see only the data, and only the portlets, that I'm allowed to view.

The Role of the BI Portal Page Designer

At Oracle, we also have a page designer. This is not an IT person. This is a graphics design expert, a user interface expert.

And we figured out, pretty early on, that to make a successful business intelligence portal we need to make the portal easy to use.

So we incorporate, now, graphics design expertise – which dictates how many clicks it should take to do a particular service, and looks at the navigation within the portal.

And when you go deep down within one portlet, is there a link across to another appropriate portlet without having to come all the way back out to the user interface again, to the original portlet?

So, page design is very important and has made the BI portals at Oracle very successful.

The Role of the BI Portal Page Viewer

We've also included the page viewers, the end users if you like, in the definition of a portal, a business intelligence portal.

This is absolutely mandatory. These are the people who are going to use this user interface. They need to be included in the development team.

We need to get their buy-in that this technology is going to be used by them.

Now, these people need, sometimes, to be computer literate – but they're not necessarily an IT professional.

They're people who could just be running the reports that are available, up to users who are doing the statistical analysis using query and analysis tools or the data mining or even the building of the data warehouse or data mart.

The Role of the BI Portal Librarian

In many of the companies that we've worked with on business intelligence solutions, they've also decided they need a librarian. It's actually very easy to figure out whether you're going to need a librarian. Look around your organization's Web sites.

~ Are there out-of-date applications?

~ Are there out-of-date pages? Are there way out-of-date pages?

Then perhaps you should look at this particular function within your organization.

This is somebody who is going to:

~ Monitor the content on an ongoing basis;

~ Check in the new portlets that have become available; and

~ Check out content that's held in the portal for modification.

This is more for maintenance – because we all know that a portal that gets out of date is going to be less useful than one that is 'bang up to date.'

The Role of BI Portal Content Management

Content management should really be an automated function of the portal technology.

I know going back three to four years that this was a function that people would put into the business intelligence portal team. But nowadays portal technologies have automated this function.

So, ensure that the portal technology that you're using has automated the function of content management: the ability to publish content within the portal and make it automatically available.

The Role of the BI Portal Metadata Architect

Now, last, but by no means least, is our metadata architect.

Metadata is that layer of data that sits between the raw data in the database – the tables, columns, and rows that are often not named in a way that I understand them.

Above that we put a metadata layer – a business layer, if you like – that will allow me as a user to understand the raw data.

That metadata can:

- ~ Define customers
- ~ It can define employees
- ~ It can define invoices
- ~ It can define sales campaigns and marketing campaigns

... and can give me a business view of the organization on the raw data.

So a metadata architect is an integral part of the BI portal development team for controlling and defining these perspectives and categories.

Now let's hear from Matt Rhoades on Henkel's implementation of its BI portal, and the structure of their BI portal development team.

Matt Rhoades: Henkel's BI Portal Development Team

On our portal team:

- ~ We have one person who does the basic portal skeleton infrastructure;
- ~ And then we have a person who does the user administration and maintenance;
- ~ And then we also have a few developers who develop Web-based applications.

We found, a couple of years ago, that we're IS guys – and we may not understand all of the aspects of business, and finance, and accounts receivable, and payables, and things.

And, we can learn it over time. But having a person who understands the business analysis side of it, and what the user wants, has been a great asset to our team.

Because they can go out and be that middle layer buffer between us and the users, and can derive all of the requirements of the user, put that in specifications format, and then come back to us – and we can develop that, then, with their assistance.

So that's been a great asset to our team.

Well, again you have to look at:

- ~ The users that you're supplying;
- ~ The number of users

And you have to be able to:

- ~ Build an infrastructure that supports a 24 x 7 environment where the users can access that information from anywhere in the world.

So, when we built our portal solution, we looked at the users, and:

- ~ How many users were going to be concurrently accessing that system at any certain time; and
- ~ Where the users were going to be accessing information from.

And we made sure that within our network they could access it from anywhere in the world.

BI PORTAL SUMMARY

Steve Illingworth: Now, we'll conclude with a summary.

I could actually summarize this in as long a time as I've taken for the presentation. But the bottom line is that many business intelligence implementations do not meet expectations – and most of those, in our experience, result from the problems in implementation that we've outlined above.

So, the key points are:

- ~ Limit the number of vendors in the solution.

You don't build a car by buying components from many manufacturers. You buy a solution. So, look for a business intelligence solution that meets your requirements.

A good implementation that's up and running fast gives a very competitive advantage.

A bad implementation is a waste of a lot of time and a lot of money.

FOR ADDITIONAL INFORMATION

If you've watched this program via the Internet or on CD-ROM, please click on the Resources tab for additional information on this topic.

And thanks for joining us for this Core Technologies program, Building a Business Intelligence Portal.

I'd like to thank you for your time and attention. I'm Steve Illingworth. If you have any questions or comments about this program, please e-mail us at:

experts@watchit.com

Thank you.

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