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product direction

Oracle ADF

Everything a server administrator
needs to know

Taking the Direct Path

More from James Morle on
efficient table scanning

OracleScene

► Serving the Oracle Community

Mobile: the Enterprise Gamechanger



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2013 Oracle Scene issues:

Issue 50

Content deadline: Friday 12th April
Publish month: June 2013

Issue 51

Content deadline: Friday 31st July
Publish month: October 2013

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DIGITAL**

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SPRING 13

Welcome to Oracle Scene

First word

Welcome to the Spring edition of Oracle Scene.

Change seems to be ever constant for most of us in our IT world; whether it's a new job, a new role, a new company or new technology. 2013 looks as though it will be no different with exciting releases from Oracle expected in both the applications and technology spaces.

Many of us use magazines such as Oracle Scene as an important means of keeping up to date with what changes are happening and to find out what others are doing. Another way of keeping abreast of changes in the Oracle world is to attend user-focused events. Nothing beats the breadth of knowledge and experience gained from interacting and exchanging information with other users and suppliers.

The user group calendar is full of these events and 2013 is an exciting year of change with the introduction of a flagship **UKOUG Applications Conference** and a flagship **UKOUG Technology Conference**. Working groups have been established for each of the events to ensure that they are structured around the detailed requirements of the respective communities and new ideas are brought to the fore.

The creation of two focused conferences strengthens the UKOUG offering for the Oracle community and broadens the appeal of the events to new attendees, as well as enabling our existing attendees to extend the things they learn about in the Oracle world.

I've been attending the UKOUG Annual Conference in Birmingham since the mid 1990s. As a member of the UKOUG

Council I'm excited by the changes planned for this event and the part I'm playing in taking this long standing event to a new level. You can find out a bit more about what the agendas will cover on page 6.

In the rest of this edition you'll find a number of quality technical and functional articles crossing a range of products that I'm sure you'll find interesting. The number of quality submissions we receive for each edition from people in the Oracle community is the best endorsement we could have that Oracle Scene is a valuable and well regarded publication. But we want even more... we can never have too much content!

This year we want to increase the visibility and reach of Oracle Scene so we're exploring additional ways to make your content available to others. In order to do this we need to keep the content coming in, so please continue to submit your articles, tips, reviews and case studies, as I expect many of you will be working on things now or in the coming months that others in Oracle communities around the world would be really interested in hearing about.

Until our next edition, have a great Spring.



Three Decades of Serving the Oracle Community

Thirty years ago this year, a group of Oracle users came together to share their experiences of working with Oracle technology for mutual benefit.

As they realised the benefits of this type of interaction, word spread amongst their networks and so UKOUG was born. On 11th January 1989, UKOUG was officially registered as an independent not-for-profit organisation. Back then we were running just three events a year.

Fast forward 30 years and how things have changed! We now run 80+ events a year, have a 20+ team of dedicated staff and have official governing bodies in place. However the ethos behind what we do and why we exist hasn't changed a bit. We're all working together towards our common goal... to "Serve the Oracle community".

Content and interaction are the key elements of all UKOUG activities. The value-add we offer is in bringing members together and providing them with high-value, relevant content and opportunities to interact with each other. All of our offerings are driven by our membership

via our elected Council. Our membership fees, which are subsidised by commercial revenue, pay for the membership benefits we offer. We rely heavily on volunteers to provide a neutral, collaborative environment, where end-user members, commercial partners, competitors and service providers can come together to share innovative ideas and best practice relating to all Oracle products.

Our key strength continues to be the diversity of our members, who exchange ideas, concepts and practices and in doing so seek to improve Oracle products and service offerings via UKOUG directly representing our members views to Oracle senior management and other user groups, both in the UK and globally.

Over the years our relationship with Oracle has grown and strengthened. That's not to say we haven't had our ups and downs along the way. But with both

UKOUG 30 YEARS
UK ORACLE USER GROUP

parties more committed than ever to working together and keeping the lines of communication open, we're confident we can overcome any bumps in the road.

See what Dermot O'Kelly, Senior Vice President for Oracle UK, Ireland and Israel, has to say about UKOUG at:
www.ukoug.org/Dermot

We would like to extend a huge thank you to all past and present members, volunteers, partners and Oracle employees who have dedicated their time and energy to supporting the UKOUG cause. We love what we do, we love doing it with you and we love doing it for you. Your endorsement of what we do makes us extremely proud and, for us, is the icing on the cake. We can't wait to see what the future holds!

Find out more about the UKOUG story by visiting our timeline:
www.ukoug.org/history ■

SPRING 13

News and Reviews

Introducing

Our new look
conferences

► UKOUG Applications Conference



► UKOUG Technology Conference

As revealed at UKOUG 2012, we are pleased to announce that we are splitting the Applications and Technology communities into two separate conferences.

UKOUG Applications Conference 2013

14th – 16th October 2013

The Brewery, London

The UKOUG Apps13 conference and exhibition will be relevant to all users and partners from the following communities:

- E-Business Suite
- Hyperion & EPM
- PeopleSoft
- CRM
- Business Intelligence
- C-level executives focusing on business and strategy
- Fusion Applications

Dates to look out for:

Call for papers opening: 25th February 2013

Agenda launch & registration opening: July 2013

UKOUG Technology Conference 2013

2nd – 4th December 2013

Manchester Central Convention Complex,
Manchester

The UKOUG Tech13 committee are keen to put together an agenda that will cover the following themes:

- Big Data
- Cloud
- Mobile
- Architecture
- Analytics
- Virtualisation
- Collaboration
- CX (IT)/Social
- Getting the most out Oracle
- Security
- OOW Highlights
- Deep dives/Labs

NEWS IN BRIEF NEWS IN BRIEF NEWS IN BRIEF

12th April Content submissions deadline for the summer edition of Oracle Scene
Submit your articles to articles@ukoug.org.uk

16th April UKOUG Engineered Systems Summit, London
A must attend for all Oracle Exadata, Exalytics, Exalogic or SuperCluster users

6th June UKOUG Fusion Applications Event, London
90% of delegates from the last event rated their overall experience as 'good', 'very good' or 'excellent'

12th June OUG Scotland 2013, Oracle Linlithgow, Scotland
Your opportunity to hear and quiz experts from Oracle's top table, on home turf

EMEA PeopleSoft Roadshow



24 APRIL 2013
CBI CONFERENCE CENTRE LONDON

Don't forget
Save the date

UK Oracle User Group invites both its members, non-members and members of other user groups to join them at this fantastic event.

Keynote speakers:

- Marc Weintraub, Director, PeopleSoft Product Strategy
- Jeff Robbins, Senior Director, PeopleSoft PeopleTools Strategy

Find out more at: www.ukoug.org/peoplesoft



Agenda highlights:

- The Value of PeopleSoft Release 9.2
- PeopleSoft Technology Roadmap and the Value of PeopleTools 8.53
- The Value of PeopleSoft Human Capital Management Release 9.2
- The Value of PeopleSoft Financials Release 9.2
- Understanding PeopleSoft Update Manager and How PeopleSoft
- Maintenance Tools Work Together
- PeopleSoft Mobile Solutions and Strategy

UKOUG 2012 saw the first **Middleware Sunday**

Middleware Sunday was a new event that ran before UKOUG 2012 and was free for delegates to attend. It brought together middleware administrators and some of the most experienced WebLogic speakers in Europe, as well as attempting to build a mega-cluster from delegate PCs at the end of the day.



Simon extolling the virtues of WLST



Jacco - everything you wanted to know, and more, about Node Manager



Frank in control with JMX



Rene is baffled why not everyone uses JRockit



Simon & Jacco working on the mega-cluster - tea... undrunk



Managed servers clustering



More delegates hard at work

Both speakers and delegates seemed to have a useful and enjoyable afternoon. We hope to run similar sessions and iron out some of the wrinkles in the workshop at future events. More at <http://bit.ly/Ysoxit>

All Eyes on Ireland

Following a successful year of development in Ireland the future is looking bright. The continued hard work, dedication and focus of the volunteers is continuing to drive the OUG Ireland events forward at a tremendous speed.

The work done in 2012 set the bar and 2013 looks promising to go over and above it. The return of old faces to the BI & EPM SIG and the fantastic interest in OUG Ireland 2013 has set the year off in the right direction. OUG Ireland 2013 is returning to the Convention Centre Dublin (CCD) with some exciting news whilst the OUG Ireland SIGs continue to push forward.

If you haven't been involved with an OUG Ireland event yet, 2013 is definitely the year to do it.

OUG Ireland BI & EPM

The OUG Ireland BI & EPM SIG is going from strength to strength and with the return of one of its Deputy Chairs, Uli Bethke, will continue to do so. Focusing on customers and practitioners based in Ireland who work with Oracle's range of BI, Data Warehousing, Advanced Analytics and Enterprise Performance Management, the SIG aims to promote best practice of BI on Oracle in Ireland whilst still discovering novel and innovative practices and techniques.

OUG Ireland Technology

The OUG Ireland Technology SIG is standing on its own two feet in 2013 and SIG Chair Simon Holt described the event as "The natural home for DBAs,

architects, and developers, where we try to look in detail at how Oracle works. Whether it's specific DBMS features, how architectural features such as Dataguard can be implemented or exciting new developments in the Oracle technology arena in general." When asked why people should get involved and attend the response was easy:

"Peer experience and validation, networking opportunities, and a solid technical environment are all excellent benefits from attending the SIG."

OUG Ireland 2013 is returning to the CCD with some exciting news whilst the OUG Ireland SIGs continue to push forward.

OUG Ireland HCM

Run in the second half of the year, the OUG Ireland HCM SIG is the perfect place for like-minded professionals to share user experiences. Made up of presentations, workshops and discussion groups, this SIG keeps users up to date on legislative changes and current trends affecting their areas of responsibility (Payroll and Human Resources), as well as providing a forum for discussions between Oracle and the user community.

OUG Ireland 2013

Following the success of 2012, OUG Ireland is back and this year's one day event offers a bumper seven streams! Including BI & EPM, Fusion, Technology, JD Edwards and an exclusive Oracle Database stream, this contains the latest information and should not be missed.

Highlights for this year include a keynote presentation from Jon Paul, Senior Sales Director for Ireland and our returning guest presenter Mogens Nørgaard, Miracle A/S - Founder of OakTable discussing how the Smartphone changes everything.

Delegates can once again enjoy numerous presentations from Oracle ACE Directors:

- ▲ **Debra Lilley, ACE Director**
Fujitsu
- ▲ **Brendan Tierney, ACE Director**
Dublin Institute of Technology
- ▲ **Roel Hartman, ACE Director**
APEX Evangelists
- ▲ **Mark Rittman, ACE Director**
Rittman Mead Consulting

OUG Ireland 2013 would like to thank its premium sponsor Oracle, as well as IBM, InsightSoftware.com and all the exhibitors who have contributed to make the event a success.



OUG IRELAND

ORACLE USER GROUP

2013 SIG Dates For Your Diary

June

- 11th: BI & EPM
- 12th: Technology

September

- 24th: BI & EPM
- 25th: Technology
- 26th: HCM

If you are interested in sponsoring any of the OUG Ireland SIGs please contact Kerry Stuart at opportunities@ukoug.org

The Business of NI Water

Debra Lilley,
Oracle Alliance Director, Fujitsu 

The most popular presentations at any user group event are customer case studies. Other users like to hear from peers what they are doing with their software investment. Another reason why I as a partner like them, is because we spend every day hearing about the problems and challenges every IT project brings and putting together a case study gives you the opportunity to step back and see just what you have achieved.

In March of last year, Alan Stewart from Northern Ireland Water (NIW) gave a presentation on their upgrade at the OUG Ireland conference in Dublin. This was the top placed presentation for the applications communities and he received a lot of great praise. It also provoked a lot of discussion around the challenges of upgrades and Dr Nadia Bendjedou, a very popular speaker on E-Business Suite from Oracle, used the story to illustrate her own presentation on upgrades.

So I was delighted in October to be invited to an event to celebrate this achievement. NIW was established in 2007 as a Government Owned Company (GoCo) – which is a statutory trading body owned by central government but operating under company legislation. The company is also a regulated utility and a Non-Departmental Public Body.

NIW has a substantial Oracle IT footprint including E Business Suite (Financials, Procurement, HR/Payroll and Enterprise Asset Management), Oracle Business Intelligence and Hyperion. Fujitsu is their Systems Integrator and when I first transferred to Fujitsu Belfast in 1996 they were on 9.4.1 of E-Business Suite Financials (when they were the Water Executive). They had a re-implementation of Oracle E-Business Suite in 2005, added HR, Payroll in 2008 and iProcurement in 2009. Then they introduced Enterprise Asset Management and Hyperion Strategic Finance in 2010. Then in 2011 they went live with the first in Ireland upgrade to Release 12. The achievements are attributed to “the partnership between Fujitsu, NIW and Oracle and the hard work and expertise of everyone involved in the projects”.

The achievements are attributed to “the partnership between Fujitsu, NIW and Oracle and the hard work and expertise of everyone involved in the projects”

An upgrade sounds like an IT project, not necessarily simple but not a business led adventure but organisations do not use IT for fun, it supports their business. NIW were dependent on the system to:

- support their day-to-day financial and payroll activities, e.g. raising POs to suppliers, receipting invoices, ensuring the weekly and monthly salaries for their 1,300 employees were available; and
- process the labour, equipment, and overhead transactions associated with over 600,000 work orders. Work orders



Top left: Silent Valley reservoir; Bottom left right: Alan Stewart NIW; Top right: Jon Paul - Oracle, Ronan Larkin - NIW, Alan Stewart - NIW, Greg McDaid - Fujitsu Dennis Badman - Fujitsu; Bottom right: Fujitsu project team.

raised in the work planning system, linked to an asset, are automatically interfaced into Oracle EAM on a near real time basis, allowing NIW staff to raise purchase orders for materials and services directly against the Work Order number to which they relate. Key contractor costs are also interfaced into EAM and linked to the work order. The General Ledger coding is automated in EAM based on the work order and asset information.

- support the production a number of sets of historic and current cost accounts under UKGAAP and IFRS accounting standards

At the same time and just in case this wasn't challenging enough, to facilitate decision making on finance, assets, people and work orders, Oracle Business Intelligence (BI) solution/data was being introduced. This would be the first implementation of R12 and OBIEE in Ireland, and to minimise the project risks Fujitsu adopted a two-phased approach, running a trial in Phase 1 to qualify the impact of the upgrade and performing

the upgrade in Phase 2 from an informed position. Regular engagement between the Fujitsu and NIW teams was critical to ensure there was a common understanding of the issues, tasks, roles and responsibilities.

The event, sponsored by NIW and Fujitsu was held at the Silent Valley Reservoir, a fantastic location and so unusual for Northern Ireland it was an amazing sunny day. Who would have expected a 'no jacket' let alone 'no coat or umbrella' for NI at anytime of year, and this was October!

Who would have expected a 'no jacket' let alone 'no coat or umbrella' for NI at anytime of year, and this was October!

The event celebrated all the Oracle projects which have been successfully

implemented. NIW CEO Trevor Haslett, and Greg McDaid (Fujitsu Client Director) praised the achievements of both teams in consistently delivering complex projects on time and to budget over the past seven years. Ronan Larkin (Financial Director) and Alan Stewart (Head of Financial Systems) highlighted their achievements. I was asked to welcome NIW on behalf of UKOUG as new members, and I spoke about Alan's presentation in Dublin and the value of that to other organisations going through similar projects.

Following the presentation of the award by Dennis Badman from Fujitsu, it was lunch of Irish Stew and wee buns (small cakes), before a walk around the reservoir and a talk about its history. Then we drove a few miles to the Fofanny Water Treatment Plant for another tour, but you had to look hard to find it, this facility is totally underground.

It would have been so easy to just have a dinner or other event in a posh hotel in Belfast but this was about something else. I am always telling my audiences that you need to know what business you are in. IT is an enabler, and this event gave everyone, the project teams from both NIW and Fujitsu and Oracle themselves an excellent insight into exactly that, the business of NI Water. Everyone can be proud of their part in helping NI Water in this journey. ■

	Pre upgrade	Post upgrade
E-Business Suite apps	11.5.10.2	12.1.3
E-Business Suite database	11.1	11.1
OBIEE/A	-	11.1.1.5.0
Hyperion Planning	-	11.1.2.1

15 minutes

with
Dr Adam Ferrari 
Vice President,
Business Analytics Software
Development, Oracle

Oracle Business Analytics in 2013: Trends & Product Direction

An interview with Dr Adam Ferrari, Vice President, Business Analytics Software Development, Oracle.
Interviewed by Jon Mead, Rittman Mead Consulting

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decision.

The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

What trends do you expect to see in 2013 in the business analytics and business intelligence space?

It's a great time to be working in analytics, there's just a lot of innovation happening. You can see areas like big data that are so prevalent, people trying to move beyond the traditional enterprise data. Data science, the application of deeper analysis of information, the consumption trends around mobile and cloud and wanting to have data everywhere, and just a lot more desire for self service, agility, high performance access, interactive access. Behind it all I think one of the most interesting trends is the keen awareness of the value of data and analytics on the part of business users who want to make more informed choices than ever and it's driving a ton of innovation and all the desire behind all those trends for more data and more ways of looking at it in relevant ways.

What integration points do you expect to see across the Oracle suite of tools? There's the purchase of Endeca, Oracle's own BI system, the integration of R and big data, how's this all going to work

together for the toolset going forward?

All the many needs of business users needing to look at data in more ways does lead to a very broad, rich platform, which raises the question how's that all going to come together? Coming in from the Endeca side, for instance, we had a standalone stack and increasingly we're looking at ways that it can integrate into the BI environment and have a lot of interplay. For example, we're doing unstructured analytics but in the context of structured data, so you like to have ways to pull in the existing data from the BI model and then also publish insights back into the BI model at the same time all the other pieces for example we're looking at the applications portfolio as a great driver for integrating the technology for example you're seeing things like some of the newer BI applications around operational planning are pulling in the more of the Essbase capability for planning and if you look out a little bit we're really looking hard at the level of predictive analytics so you can do things for instance in the planning application not just a human based formula for predictions but also true statistical

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OracleS

Interview was conducted in December at UKOUG Conference 2012
Pictured above from left: Adam Ferrari and Jon Mead

analysis to do forward forecasts as a check and a way to get an initial cut at a forecast. It's probably too many integration points to really go through but I think that is the power of the whole here really is greater than the sum of the parts and it's about building these integrations. That's why we're excited to see the Endeca product as part of the portfolio; it's a lot more powerful in combination with the other assets.

You mentioned big data and there's obviously a lot of hyperbole about big data and where it fits, how great it is... where do you see big data actually sitting, again with the integration of the product with the comments you've made... how are organisations going to using big data within Oracle technology in the coming years?

Big data has been such a big hit topic for so long yet it still feels like organisations are struggling to get traction. A part of that, I think big data emerged a lot with the web companies which initially fundamentally faced new kinds of data on a new kinds of scale, you've got technical infrastructure like Hadoop

that emerged to cope with the volumes, variety and messiness of that data, but really I think at a lot of traditional organisations the value of big data hasn't been connecting with the business users. From a technical perspective, I think one of the issues or insights there is that big data isn't best viewed as a departure from some of the analytics practises we've used in the past but it's really an extension so from a product perspective more integration of the big data technology, so looking at Hadoop as part of a piece of an overall logical data warehouse and you see us doing things like the connectors library from Oracle, we're introducing capability to connect to Hadoop within BI, loader capability for Endeca, so there's a variety of ways that instead of having big data as an island you're going to look at it more as part of the overall analytic and information management practice in situations where the data is so voluminous you need a different cost profile for storing it or it's so messy you just need more flexibility. A ton of importance in value there but it's essential it ends up connected to the business user which means leveraging

much of the infrastructure that's already there.

So you mention the business user quite a lot, does that mean that the focus is now more on the business user and the business to take advantage of the data instead of the technology?

I'm a technologist at heart so we tend to think about all the innovative approaches; in-memory analytics, home stores and new consumption approaches, more visual treatment of data. But at the end of the day, I think what's really changed is the business users. In our consumer lives we've seen so much access to great information presented in beautiful and interactive ways online the expectation has just emerged so much stronger that you'll have that access to your information in the workplace and certainly as the workforce turns over and you have more millennial, that expectation is only going to get greater and greater so I think this is a trend we've only just hit the inflection point which is exciting because it drives a ton of analytics innovation and the new expectation is where all the technical infrastructure is innovating from. ■

Engineered to Deliver

No industry has changed as much as the IT industry over the past 30 years. One reason being that across the globe, IT vendors have continuously looked to invest in and develop the most cutting edge technologies; from building innovative databases 30 years ago, to creating IT architectures consisting of various integrated business applications today.

Paul O'Riordan,
Country Leader, Oracle Ireland

Despite this constant stream of evolution, two things have remained the same: IT vendors have tried to develop solutions that outperform their competitors, and customers simply want IT offerings that can be deployed rapidly and which help to reduce costs and enhance performance.

Traditionally, to ensure customers have the fastest and strongest IT environments for their business needs – built at the lowest cost possible – consultants have helped architect bespoke IT environments consisting of best-of-breed software and hardware taken from a number of vendors. On the surface this seems like the best approach to getting the results you need. For instance, if you have deployed the best customer relationship management software from one vendor, on the leading server from a different provider, then surely your IT environment will be the best it can be?

Stunted Innovation

Unfortunately, this is rarely the case. Regardless of the IT industry's relentless drive for innovation, the performance of IT solutions will always be limited by the platforms they are deployed on. That is to say, the exact same application could thrive in one IT environment while struggling to perform in another.

Moreover, building a unique IT architecture can rapidly become a costly and complex process. While the initial cost of deploying best-of-breed solutions may seem low, organisations need to consider the cost of maintaining the technologies once live, as well as assembling the infrastructure in the first place. Both

expenditures are regularly overlooked by some organisations, or at best underestimated, as the focus remains on the initial acquisition costs. This often leads to unexpected and unwelcome costs.

Furthermore, when upgrades and patches become available for the components of the IT stack, customers are not only responsible for downloading them, but also for monitoring the impact any upgrades will have on overall performance by carrying out impact analysis, as well as requalification and regression testing. Considering some organisations will be required to apply over 100 critical security patches per year, this is no simple task, and can often lead to IT paralysis when organisations decide the financial cost of upgrading is not worth the benefits.

Additionally, building a complex IT environment consisting of technologies from competing vendors is not ideal when problems and corruptions occur within the platform. Despite everyone's best efforts, outages do occur and it is in the best interest of all parties to resolve them as quickly and efficiently as possible. However, a handful of vendors are keen to point the finger of blame at each other which can slow down the resolution time – often more time is spent working out who is at fault than fixing the problem itself. On top of this, organisations experiencing an outage will be burdened by the cost of bringing each IT organisation in to help resolve the issue.

The reality is that an IT stack built with best-of-breed components will never perform as well as it did on day one of its implementation. Initially, organisations might have the

fastest and strongest IT platform, but over time their innovative approach will become diluted and hit by rising maintenance costs and lengthy resolution times. In today's current economic climate, where it's never been more important for organisations to be the first to market with new offerings and services, is this an approach they can afford to take?

Engineered to Work Together

The IT industry does not think so, which is why we have seen a number of new IT offerings enter the market which are tailored to increase performance, lower costs and reduce implementation times: otherwise known as Engineered Systems. This new technology platform consists of pre-integrated hardware and software solutions designed and tested to work together, providing users with extreme performance, faster deployment times and easier ongoing maintenance. To build on these benefits, we are increasingly seeing the development of engineered systems that are optimised for specific industries, smaller enterprises, the cloud, and to streamline data center operations to make traditional deployments, such as business analytics, even more efficient. Needless to say, the emergence of the platform has unleashed a new wave of innovation at all levels of the IT stack.

For the first time, hardware and software development teams are required to work as one team in the building of engineered systems where all components are specifically designed to work together. The tight integration of the teams helps uncover new features and business functions built on the expertise from leading bodies in the software and hardware industries, ensuring each technology deployed within the environment is designed to fill its absolute potential.

What's more, within engineered systems, software can often be installed closer to the hardware. By deploying the two in close proximity, performance is further increased as functions, such as data filtering and data joining, can be carried out quickly and efficiently as only the relevant data and queries are fed into the system. Other innovative creations enabled by the convergence of software and hardware, which deliver extreme performance, include database functionalities being pushed into storage hardware, network functionality that is optimised for middleware communication and software functions incorporated into chip design. These new functionalities deliver an unprecedented level of insight, which is of growing importance to organisations looking to take advantage of changing market conditions and comply with industry regulation, such as online retailers and insurance companies.

and faster resolution times. This helps to mitigate the impact of any failures and is one of the biggest advantages of taking an engineered systems approach. Furthermore, because the software is reliant upon the hardware to run, it is programmed to detect any server failures and take immediate action, such as switching to a back-up server. This ensures organisations can seamlessly run their day-to-day activity safe in the knowledge that their systems will always be readily available.

Perhaps the most significant benefit delivered by engineered systems is their deployment times, which reduce the length of installations from months to weeks, and in some cases days. The testing needed when developing an IT stack consisting of solutions from various vendors is made redundant by engineered systems, which also helps reduce implementation costs, traditionally the second highest cost in any project, and free up time and budget to innovate across other business areas. Furthermore, the standardised platform means that new solutions can be seamlessly integrated into the hardware stack, enabling customers to rapidly launch new offerings and take full advantage of market conditions.

A strong example of how one customer has used an engineered system to great effect is Turkcell. The Turkish mobile communications provider needed an IT platform capable of managing one petabyte of uncompressed data, developing 4,000 business critical reports while processing 100,000 smaller report runs, and supporting analysis of 10 billion daily requests. By deploying an engineered system, Turkcell was able to achieve all of this with minimum effort, and the performance it delivers ensures the communications provider can focus and invest in better serving its customers by providing offers tailored to their needs.

Make the Impossible, Possible

Today, where organisations are tasked with doing more with less, engineered systems could prove to be a key weapon in their arsenal, and it's hardly a surprise to see Gartner predict that by 2015 over a third of the total servers shipped will be engineered systems. In the next few years more and more IT vendors are set to enter the marketplace with their own tailored offerings. The most successful organisations will be those deploying systems encouraging and mixing innovation between each layer of the software stack, rather than opting for platforms of pre-assembled solutions. There is no question about the benefits delivered by engineered systems: less risk, lower costs, and extreme performance, which when combined delivers the kind of results and business performance that – until now – simply was not possible. ■



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Paul O'Riordan has been Country Leader of Oracle's Irish operations since January 2006 acting as the company's primary liaison with the broad range of Public Sector and Commercial customers in the country. He has also been responsible for its Technology License Business, setting the strategy and ensuring Oracle's products continue to deliver value to its customers.

¹Gartner Data Center Conference presentation, "Will Fabric Computing Change the Concept of the Traditional Server?" December 2011.

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What a Server Administrator Needs to Know About Oracle ADF

Many organisations are installing or upgrading to Oracle Application Server 11g. The version numbers would seem to imply that this is just a continuation of the previous version, but no: Oracle Application Server 10g was based on the “old” Oracle application server technology stack (previously known as OC4J), but Oracle Application Server 11g is the new name for the WebLogic application server that Oracle acquired when buying BEA. This means that there are new settings to learn and a new administration interface.

Sten Vesterli,
Senior Principal Consultant, Scott/Tiger A/S ♠

Together with the WebLogic server, organisations often also deploy applications built with Oracle Application Development Framework, ADF. And these come with their own special intricacies for a server administrator to manage.

The Magic Word

In various fields, there are some magic words known only to the insiders – words that identify you as a person in the know. For a server administration tasked with running Oracle ADF application, one of these words is application module.

When you ask the developers “how many application modules does your application have?” and “what is your application module configuration?”, they will realise that you know your stuff. In all likelihood, they’ll also go back to their application and look at the application module configuration. Beginning ADF developers will tend to leave the application module settings at the default values which are unlikely to be optimal.

ADF Architecture for Server Administrators

If you have attended an Oracle ADF presentation, you will have seen the standard ADF architecture slide with five layers: View, Controller, Model, Business Services and Data Services. Fortunately, for server administrators, a simpler model

suffices (Figure 1): The one aspect of the architecture that concerns you as a server administrator is the application module layer and its connection to the database. Everything else is “somebody else’s problem”.

The Role of the Application Module

The application module is defined by the application developer when the application is built. There is typically one per subsystem, i.e. an application consisting of five subsystems will have five different application modules. Your application architect will know how many application modules there are.

At runtime, the ADF framework creates a pool for each application module. So if the application has subsystems >>

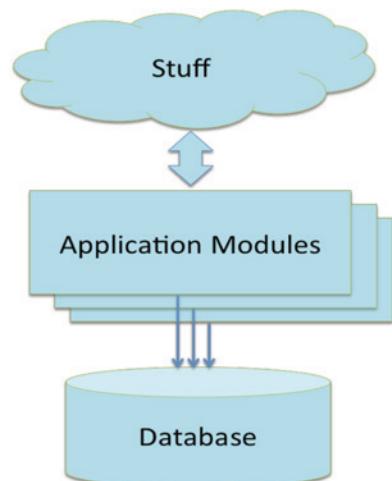


FIGURE 1

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Technology: Sten Vesterli

In MyTasksFind, DataProcessing and DataMaintenance, there will typically be three application module pools. The size and management of each pool is controlled by configuration parameters defined by the application developer. As a server administrator, you can change these at runtime; however, at the next application deployment, the developer-specified parameters will overwrite any changes you have made.

The application modules hold the transaction context for the application. This means:

- Each application module can have its own transaction
- Each application module might create its own database connection

When a user accesses a page that contains a databound component, the ADF framework will check out an application module from the relevant pool. For example, if user Sue accesses the search subsystem, she will receive an instance of a MyTasksFind application module. When the page request has been served, the application module is returned to the pool, but this module now has "affinity" for Sue's session. ADF will try to keep this application module available for Sue to speed up the next request Sue makes.

Note that by default, all application modules in the pool (whether used or not) will initiate a database connection when they are created and will keep it as long as they live.

The Challenges of ADF Applications

The two main challenges the ADF application will present you with are:

- Too many connections
- Poor performance

As an application server administrator, your job is to point out the bottlenecks – but if any changes are needed, the application developers will have to make these.

Too Many Connections

As you can see from the description of the architecture, each user might activate multiple sessions, and these connections are not released when the user is done with them. The application modules keep their connection, even when they are returned to the application module pool. A large ADF application might have 10-15 subsystems, potentially requiring up to 15 connections per user.

If this is a problem in your environment, there are a couple of solutions:

1. Tune the Application Module pool parameters
2. Disconnect upon release
3. Use nested application modules

Tuning the Application Module Pool Parameters

As mentioned above, it is a task for the application developer to set the application module parameters. However, through Enterprise Manager Grid Control, you can change the parameters at runtime to see what the effect is. It is often a good idea to work with the developers to determine the right values in a running system instead of having the developers change a value and go through the whole build deploy cycle. All the important Application Module parameters are set in the

Business Components Configuration dialog:

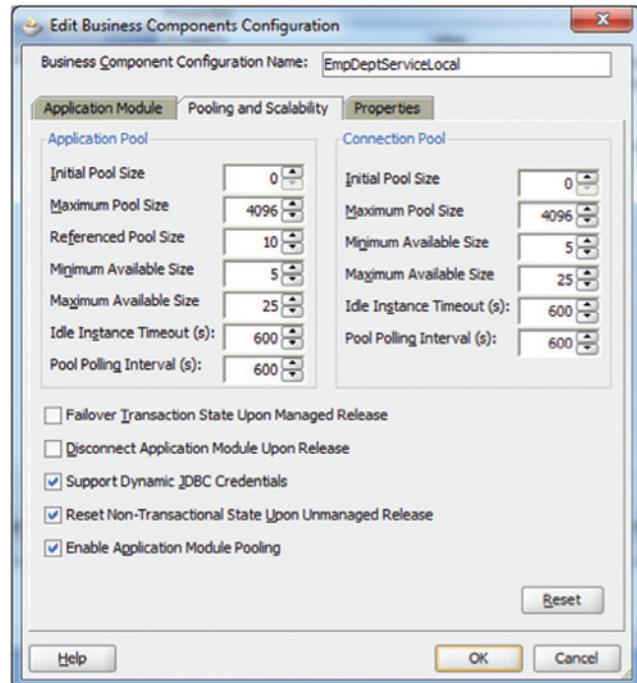


FIGURE 2

The important parameters here are:

- Referenced Pool Size – preferably set to the maximum number of concurrent users under normal load. This is the number of Application Modules that ADF will keep with session affinity.
- Maximum Available Size – set to the highest number you have memory for. ADF will try to keep the pool below this number, but might exceed this number under heavy load.
- Maximum Pool Size – leave this at a very high value. This is a hard limit and the application will fail if this number is reached.
- Idle Instance Timeout – set this to the maximum time (in seconds) that the user might use between interactions with the application. This is often called "max think time". Once this time has passed, ADF will cancel the session affinity and release the application module for use by other sessions. The default of 600 is often too high – ADF will hold session affinity for ten minutes which is an uncommonly long break in most tasks.

Disconnect Upon Release

The above dialog also contains the setting "Disconnect Application Module Upon Release". By default, this checkbox is not checked. The default setting means that Application Modules will keep their JDBC connection to the database as described above.

However, if you check this checkbox, an Application Module will disconnect from the database whenever it is released back into the pool of Application Modules.

The default setting gives slightly better performance, because the Application Module can count on the database keeping state between requests. This affects things like package variables etc. If you choose to let the Application Modules disconnect from the database each time they go back into the Application Module pool, ADF will have to spend time re-establishing the database session for each request.

Nested Application Modules

Even though an application will often have many application modules, these do not necessarily create separate database connections. In some cases, an application module can be nested with another, sharing its database connection.

It depends on the application requirements whether this makes sense. If the requirements are that a transaction in one subsystem must be independent of transactions in another, you need separate application modules with separate connections. But often the division in subsystems is more a matter of subdividing the application development task in logical parts without any specific requirement for separate transactions. In this case, nested application modules can be a solution.

As an application server administrator, you cannot make this decision – that is for the application architect to decide. But if the application creates an unmanageable number of database connections, you should ask the architect if there are places in the application where he could use nested application modules.

Poor Performance

The ADF components automatically implement a lot of caching and other clever tricks, so the application should always run well for one user. Sometimes you do find issues when the application is deployed to a test server with realistic amounts of data – if you point out to the developers which SQL statements their applications are executing, they will be able to find the misconfigured component. A classic example is the use of a drop-down list box on a very large data set – in this case, ADF will try to retrieve all values before presenting the list, potentially waiting many seconds. In this case, the developer should simply change to an Input List of Values component that present a search dialog for limiting the value set before sending the query to the database.

When you reach load testing, however, you might hit a different problem. You know from earlier that ADF keeps a

pool of Application Modules. But what happens under peak load when the users request more Application Modules than the configured maximum? In this case, ADF starts passivating Application Modules. This is done to the database (you'll see a PS_TXN table appear in your application schema) and is an expensive operation. It is like swapping to disk – ADF will store the entire state of an Application Module in the PS_TXN table in order to release it for use by another session. Once the first session comes back with the next request, the state must be restored from the table. Passivations are occurring if you see new rows being created in the PS_TXN table – this should never happen under normal load.

Finding the Ceiling

You want the Application Module pool parameters as high as possible – but you don't want them so high that your application server starts swapping memory to disk. Since there is no easy way to determine memory consumption for an application module, you need to experiment to find the right settings. The procedure goes like this:

1. Set the JVM max memory parameter for the WebLogic managed server instance where your ADF application is running. Allocate as much memory as possible without the server swapping to disk.
2. Set the AM parameters ridiculously high (9999)
3. Start a load test with a one-second ramp-up (i.e. a new session is started every second)
4. Monitor number of application modules and JVM memory usage in Enterprise Manager Grid Control. This tells you how much memory each Application Module uses.
5. Note when you hit the JVM max memory ceiling.
6. Tell your developers to set the AM pool 20% below the ceiling (you want a bit of slack below the ceiling – once you hit JVM max, the application starts failing)

If your application uses multiple Application Modules, you'll need to iterate this process over various scenarios.

Conclusion

An ADF application is just like any other application. The developers will focus on getting it running for one user and consider the job done. As an application server administrator, you'll be the person people will look to when the application does not perform under load. With the knowledge presented in this article, you are now able to understand where the problem is and work with developers to remedy the situation. ■



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Sten Vesterli is an Oracle ACE Director, recipient of the ODTUG 2009 Best Speaker award and author of "Oracle ADF Enterprise Application Development - made simple." He is a frequent speaker at Oracle conferences and is currently writing his third book. He is an Ironman triathlete and lives in Denmark.

Using the Oracle BI Toolset to transform a supermarket's information management strategy

Effective data information management and governance is becoming increasingly important across all sectors in order to reduce costs, increase efficiencies and gain greater customer insight.



Themis Michaelides,
Solutions Director &
BI Practice Head,
Mastek

Recognising this, a UK leading supermarket implemented a multi-year business transformation programme, investigating how it could gain demonstrable benefits in time, cost and quality on the delivery of its key business information system. This analytical information would then support a number of business processes and lifecycle improvements.

The issues

- **Siloed Data.** The company had been running multiple systems that didn't always talk to each other, creating silos of information. This resulted in poor sharing and analysis of valuable data, increased costs, high manpower requirements and duplication of efforts. The knock-on effect was to make it difficult to support the business efficiently, and risked slowing the company's growth.
- **Complex Systems Landscape.** They recognised the need to bring all of their IT systems and operations under the same umbrella, not only to achieve greater day-to-day efficiencies, but also to consolidate its business-critical data, improve financial reporting and increase supplier competition.
- **No Data Management Strategy.** While the company had a well thought out technology strategy, their data management strategy had not been clearly defined.
- **Delayed Business Benefit Realisation.** The time between identifying business requirements and 'going live' with new functionality was too long, meaning high upfront costs with a long time to wait before seeing any business benefits.

The Solution

Given the challenges that the programme was facing, the supermarket asked Mastek to step in and provide a way forward.

Mastek worked closely with the supermarket to understand the business challenges and requirements in relation to their overall BI/DW programme, offering the following solutions:

- **Team with specialised technical expertise** – Provide a team with deep experience in developing and working in complex data warehousing environments, able to engage with the business issues from the outset.
- **Address the issues of escalating costs** – Propose and implement a pricing model, which provided cost certainty to the supermarket.
- **Delivery methodology for quick results** – Use Mastek's agile delivery methodology to ensure that the prioritised business benefits are delivered incrementally throughout the project.
- **Aptitude and attitude to match the ambitions of the programme** – 'Can do' approach to problem solving. Collaboratively working together to overcome issues. Transparency with clear ownership of delivery.
- **Seamlessly embedded within the business** – The Mastek team embraced the supermarket's culture – one team ethos.

Mastek implemented a data warehousing, business intelligence solution integrated with the complete Oracle retail suite, which included modules that cover merchandising, planning and stores

applications as well as the Oracle E-Business Suite for financials, HR/payroll and manufacturing.

Benefits

- **No downtime** – During all phases of the project, before the migration to the new platform was complete, Mastek ensured that the supermarket could extract pertinent data from its legacy systems and combine it with data from the new systems. This meant that the IT upgrade had no impact on business-as-usual operations.
- **Reduced costs** – Mastek's precise project delivery processes meant that the first phase of the project was delivered on time and to budget, eliminating the spiralling costs incurred when projects overrun.
- **Early business benefit** – Mastek's incremental approach to delivery meant the team could benefit from staged releases that they could start to use before completion of the full project.
- **Greater systems efficiencies** – Mastek delivered a data warehouse/business intelligence system bringing together existing legacy systems to provide the supermarket with industry-specific metrics and analytics that they can leverage to tune their market strategy and improve their bottom line.

For more information on this and other Mastek business intelligence projects, contact us on:
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or by email at: info@mastek.com
www.mastek.co.uk



The Tools of Fusion: Oracle JDeveloper and Oracle ADF

Mobile: the Enterprise Gamechanger

On Monday 3rd December 2012, I was in a hotel room in Birmingham preparing my session for the UKOUG conference when the BBC breakfast news reported that it was “Mega Monday”, the year’s busiest online shopping day. But what caught my attention, more than anything, was the statistic that shopping on a Smartphone was expected to rise 334%. A quick search on the BBC website then threw up a statistic that 12% of all online shopping was taking place on a phone. Which got me thinking. During the conference sessions, were people taking notes, tweeting or Christmas shopping?

Grant Ronald,
Director of Product Management, Oracle Application Development Tools

In many ways, consumer behaviour is now driving how many businesses work. We've seen the same with social media where businesses are following the social trend, rather than setting it, and in that respect mobile is no different. Forbes Mobile Business Statistics for 2012 (<http://www.forbes.com/sites/markfidelman/2012/05/02/the-latest-infographics-mobile-business-statistics-for-2012>) gives an insight into the impact of mobile devices on businesses,

where they predict: “By 2015 mobile app development projects will outnumber native PC projects by a ratio of 4-to-1”. Other analysts report Smartphone sales outstripping PC sales for the first time (http://news.cnet.com/8301-17938_105-57371181-1/smartphone-shipments-top-all-pcs-for-the-first-time).

That said, regardless of how you slice and dice the statistics, or how much of a pinch of salt you take them with, the mobile

revolution is already changing the way we do business; and that is going to affect you, me, Oracle, even Oracle's Fusion applications.

The Mobile Challenge

So what makes mobile application development so different? There are some obvious differences when comparing “traditional” web applications to mobile applications. Firstly, displaying on a 4inch >>

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Technology: Grant Ronald

phone screen will limit what information you are able to present to your end users. And remember, your users are working without a mouse so are “pinching”, “tapping” and “swiping”. You then have to take into account the various orientation options and the fact that a tablet would typically offer more real estate. This means the user’s interaction with the application will be completely different when accessing from a mobile device than when accessing via a desktop computer and so you are going to have to seriously rethink your user interaction patterns. You also have to balance out how much processing you want on-device versus centralised data/services which use network bandwidth and introduce latency. Mobile devices today have some serious processing power but does it make sense to pull thousands of records onto the phone to work with them? Someone, somewhere, has to pay for every byte of data transmitted.

In addition to those physical challenges, you also have to look at the technological challenges. Android and iOS devices pretty much cover the majority of the market today, although Windows 8 could change things. Each has its own development environment, tools, tips and tricks so unless you can guarantee all your users will only ever use the same mobile device (unlikely to say the least), then you are forced to duplicate your skills, code, testing and deployment for every application. And who knows how the market or technologies might change over time. Just look at how Apple’s decision not to support Flash instantly tipped the balance of rich web user interfaces from Flash to HTML5. Add to all that the challenge of securing the device/applications/data, synching off-line data back to the central servers and integrating with on-device features like cameras and GPS, and you’ll see that mobile isn’t simply a different window onto your existing applications.

Your Mobile Options

But wait a minute, if my mobile phone has a browser and my web application is accessible via a URL, doesn’t that mean my application is already mobile enabled? Well, yes and no. You have two main options for mobile applications: mobile web applications or native mobile applications. The former is, as noted,

accessible via a browser. The problem here is that because it is running from a server, there is limited (or at least, more complex) access to on-device features, and of course, it can’t run in an offline mode.

On the other hand developing an on-device native application that runs on the device, allows you to more fully exploit the power of the handset, on-device capabilities, limited bandwidth or offline working and native look and feel. And don’t forget consumers are already sold on the idea of having applications installed and running on their phones. The flipside of a device-specific implementation is the lack of portability and reuse between platforms and that fact that development skills will be different for each device and very different to those used to develop your traditional enterprise web applications.

A Hybrid Mobile Solution

As you might have expected, the requirement to mobilise applications and the challenges of development were something addressed in Oracle’s own Fusion applications. As previously covered in this column, Oracle ADF is the Java productivity framework used to build Fusion applications, but could that framework be used for providing Fusion applications physically running on a phone or tablet? The initial answer was “no”. After all, how could a Java framework run on iOS which doesn’t support a Java Virtual Machine (JVM)?

The answer lies in the modular architecture of Oracle ADF which made

it possible to provide an extension to the JDeveloper IDE and Oracle ADF, which would run applications on Android and iOS phones (Figure 1).

The “magic” is in providing a native “container” in which the ADF Mobile application executes as a local application on the Android or iOS device. Within this native container is a light-weight implementation of a JVM, thus allowing developers to use Java for developing the business model and client logic. And just like the server-side ADF, ADF Mobile applications are based on a Model-View-Controller architecture. So the Model, as in the existing server-side ADF implementation, allows business logic to be written in Java, it can read and write data to a local SQLite database, and access remote business functionality via web services. The View layer provides a set of mobile-specific UI components, called AMX, which render state-of-the-art HTML5, CSS and JavaScript, as well as providing data controls and bindings to the business services. The navigation and animated transitions between views is handled by a lighter version of the ADF task flow and can be developed visually and declaratively using the task flow diagrammer in Oracle JDeveloper.

Other mobile specific features such as integrating with the camera, GPS, email and SMS are provided via integration with PhoneGap (a widely used open source library for cross platform mobile device access) with the specifics being abstracted away from the developer by ADF data controls.

ADF Mobile Architecture

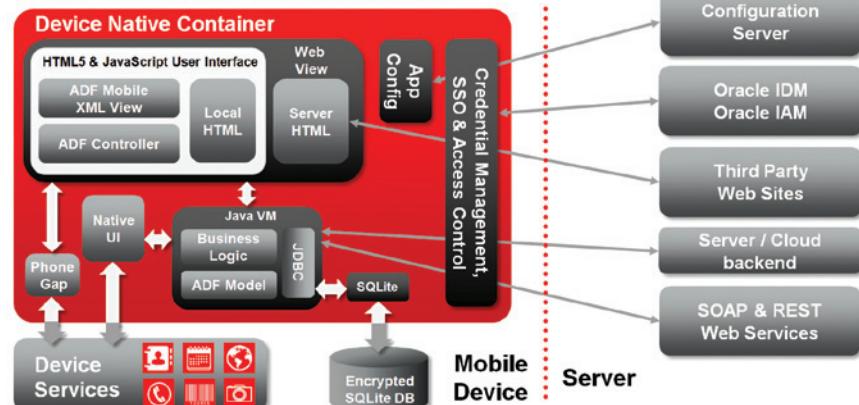


FIGURE 1 – ADF MOBILE ARCHITECTURE

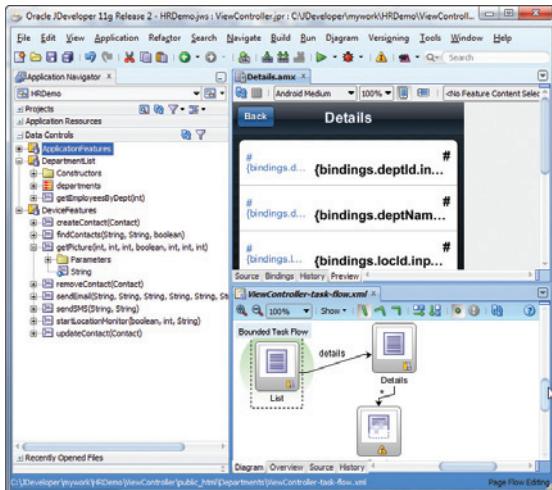


FIGURE 2 – FAMILIAR DEVELOPMENT ENVIRONMENT

The brilliance of this solution is that it's the same development environment, the same programming language and the same development gestures for those already using ADF. The developers who built Oracle's Fusion applications, who may have considered themselves Java or ADF developers, were instantly Android and iOS developers! All this functionality comes as an add-on extension to JDeveloper which can be downloaded in version 11.1.2.3.0.

Figure 2 shows an ADF Mobile application under development including a preview of the current page. The leftmost panel shows the data controls for the project.

Here you can see abstractions over device-specific features such as `getPicture` (for camera integration) and `sendEmail` (for integration with on-device email). As is the mantra throughout ADF, the developer is not being burdened with having to understand the specific implementation details of accessing a camera. That functionality is provided by the framework and exposed as a data control. And of course it is that abstraction which means development is the same for Android or iOS and any other platform that is supported. It is only when the application is deployed that you select device specific attributes and you have a device specific deployment.

As for the runtime, ADF Mobile's UI components provide a native look and feel. Figure 3 shows an example of an ADF Mobile application running on an iPhone simulator. Features like the springboard (shown on the left) show a grid of icons that give access to areas of application functionality, whilst the image on the right shows a data list (of employees) which can be "scrolled" via a swipe gesture, and tapped to drill into that employee information. This is the look, feel and interaction that an iPhone user would expect for a native application.



FIGURE 3 – ADF MOBILE NATIVE LOOK AND FEEL

Conclusions

ADF Mobile was released to the public in October 2012, and like the server-side ADF, underpins the development effort of Fusion applications, this time for on-device mobile enterprise applications. Even in the short time since its release the interest has been phenomenal. The 2012 UKOUG conference ran 3 days of ADF Mobile hands-on that were mirrored at the German Oracle User Group (DOAG) and Oracle World, and mobile has been front and centre at many of the Oracle technology events in the past 6 months. The reason for so much interest? Simple: this isn't a new technology looking for adoption or trying to find a market. This is enterprise development catching up with massive pre-existing consumer demand within a well established market which, if you believe the analysts, is set to outstrip native PC development. So the question is, will mobile be a game changer for you?

To see how ADF Mobile can be a game changer for your mobile strategy visit the ADF Mobile page at <http://www.oracle.com/technetwork/developer-tools/adf/overview/adf-mobile-096323.html> ■



ABOUT THE AUTHOR

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Grant Ronald is a Director of Product Management working for Oracle's Application Development Tools group responsible for Forms and JDeveloper where he has a focus on opening up the Java platform to Oracle's current install base. Grant is author of the "Quick Start Guide to Oracle Fusion Development: JDeveloper and Oracle ADF", published by McGraw-Hill.

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UKOUG: Events 2013

UKOUG Events Timeline 2013

- JANUARY**
- 16th: UKOUG Solaris SIG Meeting
 - 29th: UKOUG Database Server SIG Meeting

- 5th: UKOUG Development SIG Meeting - App Development for Mobile Devices
- 7th: UKOUG Public Sector HCM Customer Forum
- 12th: UKOUG Oracle Financials SIG Meeting
- 20th: UKOUG Solaris SIG Meeting
- 21st: UKOUG Primavera SIG Meeting
- 26th: UKOUG Hyperion HFM SIG
- 27th: UKOUG Supply Chain & Manufacturing (SCM) SIG Meeting

MARCH

- 7th: UKOUG Public Sector Applications SIG
- 12th: UKOUG Business Intelligence & Reporting Tools SIG Meeting
- 13th: UKOUG Application Server & Middleware SIG Meeting
- 13th: UKOUG Apps DBA for Oracle E-Business Suite SIG Meeting
- 14th: UKOUG Public Sector HCM Customer Forum - Payroll Processing Workshop
- 14th: UKOUG Partner Forum
- 20th: UKOUG Solaris SIG Meeting
- 21st: UKOUG HCM SIG Meeting
- 21st: UKOUG Coherence SIG

- APRIL**
- 16th: OUG Scotland DBA SIG
 - 17th: UKOUG Solaris SIG Meeting
 - 18th: UKOUG Public Sector Financials Customer Forum
 - 23rd: UKOUG Availability Infrastructure & Management SIG
 - 25th: UKOUG Oracle Spatial SIG Meeting

UKOUG Engineered Systems Summit

16th April 2013

Location: London

EMEA PeopleSoft Roadshow

24th April 2013

Location: CBI Conference Centre, London

MAY

- 2nd: UKOUG Higher Education SIG Meeting
- 9th: UKOUG Database Server SIG Meeting
- 14th: UKOUG JD Edwards SIG Meeting
- 15th: UKOUG Solaris SIG Meeting
- 15th: UKOUG Oracle Financials SIG Meeting
- 21st: UKOUG Development SIG Meeting
- 22nd: UKOUG Projects SIG Meeting
- 23rd: UKOUG Coherence SIG
- 23rd: UKOUG Public Sector HCM Customer Forum

JUNE

- 5th: UKOUG Public Sector Applications SIG
- 11th: OUG Ireland BI & EPM SIG Meeting
- 12th: OUG Ireland Tech SIG Meeting
- 13th: UKOUG Supply Chain & Manufacturing (SCM) SIG Meeting
- 18th: UKOUG Primavera SIG Meeting
- 18th: UKOUG Hyperion Essbase & Planning & HFM SIG Meeting
- 19th: UKOUG Application Server & Middleware SIG Meeting
- 19th: UKOUG Solaris SIG Meeting
- 20th: UKOUG HCM SIG Meeting

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6th June 2013

Location: Oracle City Office, London

OUG Scotland 2013

12th June 2013

Location: Oracle Linlithgow

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- 18th:** UKOUG Public Sector HCM Customer Forum - Workshop
- 18th:** AIM & Database Server combined SIG

JULY**AUGUST****SEPTEMBER****OCTOBER**

- 1st:** UKOUG Apps DBA for OEBS
- 2nd:** UKOUG Supply Chain & Manufacturing SIG Meeting
- 3rd:** UKOUG Partner of the Year Awards 2013
- 8th:** OUG Scotland DBA SIG
- 8th:** UKOUG Database Server SIG Meeting
- 9th:** UKOUG Application Server & Middleware SIG Meeting
- 16th:** UKOUG Solaris SIG Meeting
- 22nd:** UKOUG Availability Infrastructure & Management SIG Meeting
- 23rd:** UKOUG Oracle Spatial SIG Meeting

**UKOUG Primavera
2013****10th October 2013**

Location: London

NOVEMBER

- 5th:** UKOUG HCM SIG Meeting
- 12th:** UKOUG Higher Education SIG Meeting
- 13th:** UKOUG Application Express (APEX) SIG Meeting
- 14th:** UKOUG Public Sector HCM Customer Forum - Workshop
- 14th:** UKOUG Coherence SIG
- 20th:** UKOUG Solaris SIG Meeting
- 21st:** UKOUG Public Sector Financials Customer Forum

**12-13th November 2013****UKOUG JD Edwards Conference 2013**

Location: Royal Berkshire Conference Centre

DECEMBER

- 18th:** UKOUG Solaris SIG Meeting

**2nd-4th December 2013****UKOUG Technology Conference 2013**

Location: Manchester Central Convention Centre

**Tom Kyte Seminar
2013****5th December 2013**

Location: Manchester

**14-16th October 2013****UKOUG Applications Conference 2013**

Location: The Brewery, London

Database Virtualisation and Instant Cloning

Existing database cloning technologies allow increased development output, fewer bugs in production, and reduced DBA workload. Database virtualisation, built upon these technologies, can greatly increase these gains. In this article we'll examine the history of using database clones to improve application development and the technical advances of thin provisioned clones and ultimately database virtualisation that allow massive gains in productivity.

Kyle Hailey, Performance Architect, Delphix

Introduction

Oracle estimates that customers deploy, on average, 12 clones of production databases to non-production environments. These database clones are used to support the software development lifecycle – developing new functionality, testing new versions of applications by quality assurance (QA) and user acceptance testing (UAT) prior to production. The clones are also used for reporting and ad hoc information queries. Further, Oracle predicts this average will double by the time Oracle 12c is adopted.* Today, most cloning is accomplished by creating full physical copies of production databases. These full physical copies are time consuming to make, requiring significant DBA time, storage space, and generally lead to project delays.

Development demands preclude organisations from working directly with the production database. Development of new versions of applications must be performed in a sandbox where schema changes and data additions, subtractions, and manipulations can be performed without affecting business continuity. After development, QA and UAT testing must be done on a system that matches the development specifications, along with suitable data. Finally, ad hoc and reporting queries can have unexpected resource consumption which negatively affects performance on production systems.

Development and QA processes can further exacerbate the need for copies. Developers generally work on separate branches of code which can have associated requirements for database schema changes or specific datasets. If developers are sharing a database copy, the job falls to the developers to make sure they

approve any changes and these changes are compatible with what everyone else is working on. This process of approving changes alone can take weeks and add much more time debugging when data or schema changes break others' code. Ideally, developers would operate in a sandbox with their own copy of the production test database.

QA generally run multiple regression test suites, validating that the newly developed functionality works and that existing functionality hasn't broken. When working with a single copy of a production database, this puts QA in a bind – they either have to run all tests suites simultaneously or serially. When the test suites are run simultaneously, teams run the risk of compromising the results as data are modified by multiple independent tests. Test suites can be run serially – refreshing the database copy after each test, but at a massive hit to productivity. Much like with development, the ideal scenario is a production clone for each test suite.

As an example scenario, a customer with a 1 terabyte database with 100 developers and 20 suites would need close to 130 production database copies (one database copy per developer a test suite, and a few extra for branching, merging, ad hoc queries, and reporting). Understandably, very few companies have the resources (DBA time, storage) to provision these, let alone keep them refreshed for the duration of the project.

Given all the high demand for clones of production databases, companies and DBAs often struggle to keep up and must make

* Keynote by Charlie Garry, PM Oracle Database, at the December 2012 NYOUG conference

sacrifices in quality or quantity. The compromises reached are generally fewer, shared databases, partial subset databases, or a mixture of both.

Solutions

Development productivity gains, reduction of production bugs, and DBA time savings have been available without extra licenses through little known functionality in Oracle since version 11.2.0.2. Even greater productivity gains are available with industry leading technologies, supporting additional versions of Oracle and other leading databases. These technologies enable productivity gains by reducing the workload and resource required to provision multiple copies of production databases.

In our previous example, creating 130 copies of a 1TB database is easily possible in the space of a single copy of the production database using thin provision cloning. Thin provision cloning gives enormous disk savings by sharing the majority of source database data blocks. A large portion of database blocks across multiple copies of a database remain the same, thus thin provision cloning allows those unchanged blocks to be shared between different clones. This technology ultimately led to database virtualisation, which goes beyond thin clone provisioning to dramatically reduce the overhead of managing many cloned databases providing significant agility to development teams.

Database virtualisation is based on the core technology of thin provision cloning, which provides clones of production databases in less space and time than making full physical copies. Database virtualisation evolves this technology to provide specific management controls, allowing virtual databases to be created, refreshed, rolled back, cloned, branched and deleted in minutes. Virtual databases can be provisioned from any time frame (down to the second) within the source database's retention window.

This functionality allows each developer and each QA test suite to have their own full copy of a production database. Further, developers and testers can have access to weeks worth of backup databases, in the space of a single backup. These backups can be brought online in minutes, data reviewed or extracted and the copy removed in minutes. Database virtualisation allows DBAs to quit having to make compromises – they can provide any number of databases without worrying about the scope of the effort or the space required, and developers and testers can ensure significantly higher quality with more complete data.

In recap, the three industry technologies available for making clones are:

1. Full physical clone
2. Thin provisioned clone
3. Database virtualisation

Next we'll describe how each of these technologies solve the problems presented by creating copies of production databases, and the benefits that each evolutionary step provide.

Technologies

Each of the technologies follows along an evolutionary path – full physical clones, thin provision clones, and database virtualisation offer the ability to create multiple copies of production databases, but where they differ is in implementation feasibility and automation.

Full Physical Clone

Full physical clones are the classic way to make copies of production databases to non production environments. Full copies are just that – an entirely new instance of a database, separate from the production systems. These clones are time consuming, resource intensive, and space consuming. On average, the time to create a full physical clone is about two weeks from initial request to useable database instance. To DBAs the core issue is clear – significant work and time is invested to make exact copies, much of which is unused meaning that the majority of the data blocks are and will remain identical. Further, the work done by DBAs to create the database copies is immediately out of date and there is no easy management solution for maintaining, refreshing, or modifying these clones. Database copies can be created, however significant effort is required from the DBA, development and QA teams to work around the limitations of the system.

Thin Provisioned Cloning

Thin provisioned cloning was the first technology to address the issue of storing large numbers of identical data blocks. Thin provisioning introduces a new layer over a copy of a source databases. Each clone has a separate thin layer where the clone maintains its changes to the central copy, which remains unchanged. As each clone has a separate thin layer that only it can see, each has the appearance of being a full physical copy of the source database. Thin provisioning can eliminate much of the space demand of database copies, reducing the associate storage cost of non-production database copies.

There are three categories of thin provisioning technology:

1. Single point in time
2. Multiple but limited points in time
3. Multiple but limited points in time in a rolling window

Single Point in Time

Single point in time thin provision cloning is the simplest thin provisioning technology, but the least flexible. Single point in time thin provisioning takes a full database backup at a point in time and allows multiple clones to open this backup. The technical innovation is allowing each clone to write any changes to a private area, thus each clone shares the majority of data blocks with the other clones but the private change area makes it appear to each clone as if they have a full size read/write copy of the database. The downside to this technology is that it does not account for database refreshes – any time a clone requires a newer version of the source database, then an entire new copy of the source database has to be made. Further, it is only appropriate for situations in which high performance is not a key requirements as it is notably slower than its physical counterparts. Finally, there is significant scripting required and limited documentation available, meaning that the onus is on the DBA to manage and own the environment. >>

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Technology: Kyle Hailey

Oracle first offered this technology in an obscure feature called DBclone in Oracle 11.2.0.2, however it has performance and management overhead even in limited use and not appropriate for enterprise level development.

Multiple limited clone versions

To address the issue of database refreshes, EMC and Fujitsu offer thin provisioned cloning technology which allows sharing data blocks across multiple versions of the source databases. This technology is based on file systems that can take point-in-time snapshots. The point-in-time snapshot can be cloned to provide a private read/write version of that file system. As changes come into the file system from the source database, new file system snapshots and clones can be created allowing multiple point in time database views.

Unfortunately, after a limited number of snapshots (generally around ten), the system has to be rebuilt requiring a complete new copy of the original database. In addition to periodic rebuilds, these systems also incur major performance hits. The performance hits can be so serious on VMware's Data Directory linked clone technology that VMware recommends against using it for Oracle databases.

Continuous data versions

NetApp offers the ability to not only snapshot and then create clones from the snapshots but also drop any blocks from the original snapshot that are no longer needed, allowing a continuous rolling window of snapshots from the source database. Custom retention windows can be set up – new data blocks are constantly added and old data blocks dropped. As an example, if a two week retention window was desired, the system could snapshot the source database once a day and clones could share snapshots anywhere in that two week window. Blocks particular to snapshots falling outside of the two week time window could be dropped, thus allowing the system to run continuously without requiring rebuilds.

While this offers quite a bit of functionality not possible with other thin provisioned clones, there are a number of serious downsides that prevent most enterprises from deploying it.

- **Hardware Lock-in:** To provision this functionality NetApp requires buying specialised hardware which requires unique administration. Administrators using this functionality with the NetApp hardware are required to write custom scripts to set up the system
- **LUN-Level Snapshots:** NetApp works on LUNs, taking snapshots and making clones of the full LUN as opposed to the datafiles. As it works at the LUN level, it can not detect any corruption in the datafiles that would otherwise be found using RMAN APIs to get the database backups
- **Custom Scripting:** Custom scripting is required to make the original database backup and keep the backup updated with changes from the source database
- **Clone Creation:** NetApp doesn't supply any functionality to actually provision the clone databases, and clones can only be made from snapshots
- **Clone Flexibility:** As clone can only be made from snapshots, a number of key use cases cannot be accomplished – clones can't be created from any timestamp, can't be rolled back, and can't be branched

Oracle's ZFS storage appliance has a similar capability as Netapp but requires even more scripting and manual administration than Netapp thus has seen little to no uptake.

Database Virtualisation

Thin provisioned clones have been around for almost two decades, yet it has seen very limited uptake due to the need for specialised hardware, expert knowledge, and scripting. These barriers to entry and the limited set of use cases have ensured that thin provisioned cloning remains an underutilised technology. Database virtualisation was invented to take the benefits of thin provisioned clones, couple it with simple management, and provide significant more data agility through on-demand database access.

Database virtualisation takes the core technology of thin provisioned cloning and extends it providing the ability to:

- Automate initial source database backup, snapshots, and redo log collection
- Automate data retention, clearing out data older than designated time window
- Automate provisioning a clone from any SCN or second
- Provision clones from multiple sources to the same point in time
- Enable cloning of clones, branching clones, and rolling back clones
- Efficiently store all the changes from source database
- Run continually and automatically
- End user virtual database provisioning
- Easy enough to be run by non-DBA, non-sysadmin

Database virtualisation technology allows virtual database to be made in minutes, taking up almost no space since the virtual database only creates new control files, redo log files and a new temporary table space. All the rest of the data is initially shared. This allows the following advantages:

- Databases on demand
- Faster development
- Higher quality testing
- Hardware reduction

Databases on Demand

Virtual databases can be self provisioned in a matter of minutes, eliminating significant bureaucracy. Provisioning full physical copies can take weeks, virtual databases take minutes now by eliminating both the data copying time of the production database as well as all the time for requesting, discussing, processing and allocating resources. When a developer needs a clone they typically have to ask their manager, DBA, storage admin, etc. The managerial decision making process, administrative tasks and coordination meetings often take weeks. With database virtualisation all of the overhead can be eliminated. The developer can provision their own virtual database in minutes, with no storage overhead.

Faster Development

As the resource and operational cost of providing database copies are eliminated with database virtualisation, teams of

developers can go from sharing one full physical production copy to each having their own private copy. With a private copy of the database, a developer can change schema and metadata as fast as they want instead of waiting days or weeks of review time to check in changes to a shared development database.

Higher Quality Testing

With as many virtual databases as needed, QA teams no longer need to rely on one full copy of the source database on which to run tests. With a single database, QA teams often have to stop and refresh and ensure they're not overlapping tests. With database virtualisation, QA can run many tests concurrently and the virtual databases can be refreshed back to the original state in minutes allow immediate repeated replay of test suites, captured workloads and patch applications.

Hardware Reduction

Database virtualisation can dramatically reduce the amount of storage required for database copies. As the majority of the data blocks are similar, database virtualisation requires storing the changed blocks, and even those can be compressed.

Database virtualisation not only saves disk space but can also save RAM. RAM on the virtual database hosts can be minimised because virtual databases share the same data files and can share the same blocks in the file system cache. No longer does each copy require private memory to cache the data.

Database Virtualisation Examples

Delphix example

The Delphix Server is a software stack that implements database virtualisation using the Delphix file system (DxFS). The Delphix

Appendix:

Here are a list of the technologies that can be used to create thin provision clones:

- **EMC** – system rebuild issues after a few snapshots, hardware lock-in, requires advanced scripting, performance issues
- **NetApp** – hardware lock-in, size limitations, requires advanced scripting
- **Clone DB (Oracle)** – single version of source database only, performance issues, requires advanced scripting
- **ZFS Storage Appliance (Oracle)** – hardware lock-in, requires advanced scripting
- **Data Director (VMware)** – system rebuild issues, performance issues, x86 databases only, officially not supported for thin provisioning cloning of Oracle databases
- **Oracle 12c Snapshot Manager Utility (SMU)** – hardware lock-in, requires source database have its' datafiles located on Oracle ZFS Appliance
- **Delphix** – automated solution for both administrator and end user. Delphix works for Oracle 9i,10,11 on RAC, Standard Edition and Enterprise Edition. Fully automated with time retention windows and end user self-service provisioning. Also support SQL Server databases. With Delphix there are no size restrictions and unlimited clones and snapshots. Snapshots can even be taken of snapshots creating branched versions of source databases.

Server automates the process of database virtualisation and management, and doesn't require any specialised hardware. It only requires an x86 box to run the software and access to LUNs with about the same amount of the disk space of the database to be virtualised. The source database is backed up onto the Delphix virtual appliance via automated RMAN APIs, the data is compressed, Delphix automates syncing of the local copy with changes in production, freeing of data blocks outside the time retention window and Delphix handles the provisioning of virtual databases. A virtual database can be provisioned from any SCN or second in time during the retention window (typically two weeks).

Oracle Example

Oracle is enabling database virtualisation in Oracle 12c with Snapshot Manager Utility (SMU) a pay for licensed software utility . The utility runs on the Oracle ZFS storage appliance, where the source database data files are stored.

Summary

Thin provision cloning has been around nearly two decades but has not been widely adopted due to the high barriers to entry. These barriers, including specialised hardware, consistent system rebuilds, specialised storage administrators, and custom scripting have led to the de facto solution being physical clones. Short of a more attractive option, companies have opted to create full or partial physical clones and deal with the ramifications of incomplete datasets, refresh difficulty, and concurrent use. With database virtualisation, the hardware and management barriers have finally been eliminated allowing enterprises to offer significant database agility. ■

References:

- **CloneDB**
 - <http://www.oracle-base.com/articles/11g/clonedb-11gr2.php>
 - <http://oracleprof.blogspot.ie/2013/01/how-dnfs-database-clone-works-part1.html>
- **ZFS**
 - <http://hub.opensolaris.org/bin/download/Community+Group+zfs/docs/zfslast.pdf>
- **ZFS Appliance**
 - <http://www.oracle.com/technetwork/systems/hardware-architecture/cloning-solution-353626.pdf>
- **Data Director**
 - <http://www.virtuallyghetto.com/2012/04/scripts-to-extract-vcloud-director.html>
 - http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=1015180
- **EMC**
 - <https://community.emc.com/servlet/liveServlet/previewBody/11789-102-1-45992/h8728-snapsure-oracle-dnfs-wp.pdf>
- **NetApp**
 - <http://media.netapp.com/documents/snapmanager-oracle.pdf>
 - [https://communities.netapp.com/docs/DOC-10323 flexclone](https://communities.netapp.com/docs/DOC-10323)
- **Delphix**
 - <http://delphix.com>



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Kyle is the designer of Embarcadero's DB Optimizer and a principal designer for the Oracle Enterprise Manager performance pages. He is a member of Oracle Oak Table, an Oracle Ace, co-author of Oracle Insights, and was a technical editor of Oracle Wait Interface. He holds a patent in the area of database performance diagnosis, and has been a speaker at HotSos, NOCOUG, RMOUG, NYCOUG, Oracle World and DB Forum. Kyle also teaches classes around the world on Oracle performance tuning and currently works at Delphix on database virtualisation.

The Chart of Accounts

An introduction to best practice design

One of the key measures of success for an E-Business Suite implementation is the design of the Chart of Accounts.

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Ian Boyling,
Director of ERP,
Prōject

Get the design right and transaction entry will be quick and easy, data quality issues will be minimised and timely reporting will be a cinch. Get it wrong and after a year or two your organisation could be staring down the barrel of an expensive re-implementation.

This article begins to explore some important decisions to be made when designing a Chart of Accounts, providing some best practice tips and highlighting some common pitfalls.

Firstly, there is no “model” answer for designing a Chart of Accounts (CoA from here on in). If there was, I would not be writing this article. Many design decisions will still depend on regulatory reporting, industry specific requirements and, well, sometimes organisational politics. However, there are still a good number of principles that are common to all implementations.

To give specifics, some colleagues and I at Prōject have been involved in an ongoing debate over the last few years about the inclusion of a “project” segment in the CoA. Whist this is perfectly acceptable for organisations that do not

use Oracle Projects, a number of issues arise for those that do (such as having two versions of the truth; one in the General Ledger and the other in Project Accounting). Anyway, I am not reigniting that debate here; there are a number of discussion threads on LinkedIn if anyone feels particularly strongly about this topic! The point is that nothing prevents the implementer from setting up the system in this way; there is no warning that is given about any potential implications. The Oracle implementation documents for the E-Business Suite are typically good for informing implementers what can be done, but are often light on the details of what actually works in practice. Oracle customers usually find this out the hard way, and end up footing the bill.

I have encountered a number of customers who are re-implementing R12 (as opposed to upgrading from 11i). The main reason for re-implementing is usually that a number of lessons have been learnt since the original implementation. The most frequent lesson learnt that I have encountered? The design of the CoA. So, how can something so core to the success of an E-Business Suite implementation go so

catastrophically wrong that one needs to re-implement? From my experience, as an implementer of E-Business Suite and reporting products, the main source of the problem lies in the implementation approach itself.

I have seen many E-Business Suite implementation projects where reporting appears to be an afterthought; something to be considered after the E-Business Suite has gone live or the configuration has been locked down.

In many cases the reason given for this approach is that either budget is limited or resources are stretched. However, this often proves to be short sighted, as it can take a great deal of time and effort to bend reporting tools to compensate for an inefficient CoA design.

E-Business Suite implementations should be driven by inputs and outputs. There is little point in engineering a “black box” ERP system which is good at capturing data, but is notoriously difficult to get useful information out of and vice versa.

Defining CoA segment value sets and hierarchies on paper (or more likely, in Excel) in relative isolation of specific reporting requirements and tools is risky business. For example, adding segments to the CoA because they “might” be useful for reporting may actually end up being detrimental. Peripheral segments like this usually have poor data quality, do not end up being used in the way they were intended (or at all) and can create additional effort/confusion for transaction entry. In the end, no one may end up reporting on them and they become a burden. Likewise, the decision to have ragged segment hierarchies may look great on paper, but have big implications for certain reporting tools and the overhead of creating reports.

This brings me to a key design principle; keep the CoA design as simple as possible,

get the basics right for statutory, regulatory and must-have reporting and allow for extensibility. If your CoA design has 10, 15, 20+ segments, each segment must have a very compelling justification. With regards to extensibility, any changes post go-live should be strongly challenged. This includes utilising a spare segment or adding values to an existing segment value set. Having a system in a constant state of flux can also be costly.

A reporting strategy should be defined very early on in an ERP project (or ideally before it begins). This should not be limited to the reporting tool selection; the strategy should initially be written agnostic of reporting tools and should then assist in the selection process. I seem to be encountering more and more organisations that have purchased an “enterprise” reporting product before any reporting requirements have actually been defined. Even packaged reporting solutions like Financial Analytics (one of Oracle’s BI Applications) may struggle with some CoA configurations. The reporting strategy should interrogate requirements and group them into categories e.g.:-

- Operational reports/real time reports/transaction listings
- Analytical reports, charts, dashboards
- Scorecards/strategy trees
- Pixel perfect reports e.g. printed management packs and heavily formatted financial statements

Whilst products like Oracle’s feature rich BI Foundation suite may seem to be the answer to all of our reporting prayers, it may be that more than one reporting tool is still required (in some shape or form), so do not be closed to this idea. Also, do not neglect the reporting offerings embedded within the E-Business Suite (e.g. the Financial Statement Generator, or FSG to most of us). These tools may still play an important role, and usually have a much lower overhead than other options. I have often been asked to produce reports and dashboards that replicate the information readily available within E-Business Suite application pages; these requirements should always be challenged to ascertain what value is being added.

With a reporting strategy in place and reporting tool(s) selected, let’s turn our attention back to the CoA design. It is vitally important that reporting is factored in to every step of the project; demos, conference room pilots, user and performance testing. Every step. Remember, the implementation will only succeed if one considers inputs and outputs together. Unless you strike it lucky and get it right first time, the design of the CoA will most probably become an iterative process, see Figure 1.

Oracle’s strategic recommendation is to implement BI Applications alongside the E-Business Suite; and from my experience of Financial Analytics, never has the below diagram (Figure 1) been more relevant. Financial Analytics models the CoA in a very specific way, sourcing hierarchies from either segment value sets or FSG row set definitions. Depending on how your CoA has been structured, Financial Analytics may suffer from performance issues, increased complexity for report builders and the requirement for costly customisations. >>

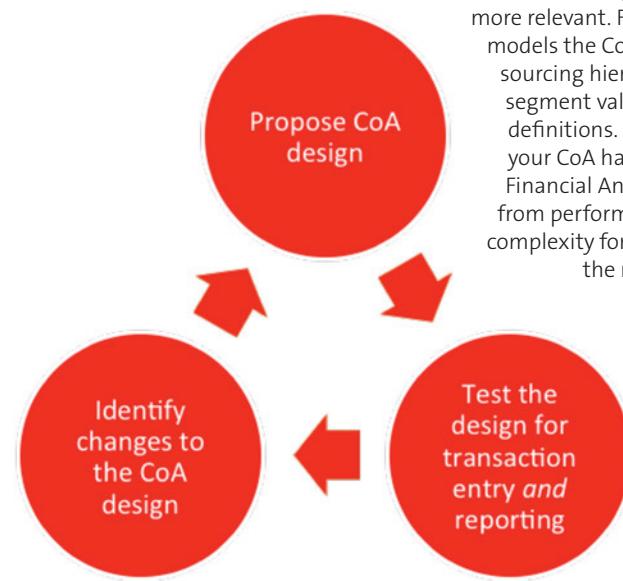


FIGURE 1

E-Business Suite: Andy Coates & Ian Boyling

I now pass over to my colleague Ian Boyling who will outline some considerations for best practice design principles and general tips on CoA design.

Having been implementing the Oracle E-Business Suite of applications for over 15 years, I have worked on numerous CoA designs. Each project has its own story to tell, however, what is common is the fact that attention to detail and extensive consideration is required in order to get it right. Key stakeholder participation is also vital since the CoA design will touch all parts of the business. It is this vast experience that has led me to document some key CoA design and best practice principles that should be considered when embarking on such a vital phase of an E-Business Suite project. CoA design best practices include consideration across a number of key areas. I highlight some of these below:

- All CoA segments should support critical accounting aspects of the business without compromising the integrity and functionality that exists within other applications e.g. it would be unwise to add a segment to the CoA structure to hold customer names. Information in the CoA should not be repeated within other modules, likewise, sub-ledger detail should not be replicated in CoA.
- The CoA structure and subsequent segment values should provide the business with reporting opportunities related to such critical business components in a logical and structured manner, without complex intervention or rework.
- Each CoA segment should be designed with scalability in mind, ensuring that there is enough room for expansion within each segment to accommodate future values.
- Each CoA segment should be flexible to accommodate changes within the business to ensure longevity of use without the need to re-implement.
- The Accounting Key FlexField (KFF) should enable an organisation to comply with all relevant legislative, fiscal and taxation requirements and commitments encountered by the business.
- Each CoA segment used within the structure should be designed to hold one type of information. Avoid having more than one **meaning** per segment, where each segment should retain its own dimensions e.g. combining department and location information into one segment is **not recommended**.
- The Accounting Key FlexField (KFF) structure of segments and resulting account combinations should provide clarity of the transaction with enough granularity for reporting. Detail should not be captured for the sake of it; the **CoA design should be driven by clearly defined outputs**.
- Segments should contain discrete value sets that do not contradict other segments. For example, if a financial report is required by cost centre, the cost centre *and* natural account qualified segments should still remain independent. Logical and structured use of summary accounts can be deployed to achieve the desired effect of account balances by cost centre using FSG reports. Equally, report filters within the BI Applications will allow balances to be returned by single or grouped cost centres.
- Once in use, the Accounting KFF structure cannot be easily changed. Changing segment values will also affect historical reporting and transactional data. Parent segment values, rollup groups and summary accounts can be changed at any time. The impact of changing these however, will mean that all touch points within reporting and security definitions must be impact assessed prior to the change, e.g. FSG definitions.
- Allowing dynamic inserts is typically enabled for an Accounting KFF, this means that code combinations are created as transactions are entered. This prevents proliferation of code combinations which may never incur transactions. Cross validation rules will be required to avoid the creation of invalid combinations.
- The Accounting KFF structure should be optimised for as few segments and combination of characters as possible, giving speed to transactional data entry without compromising flexibility, data integrity and reporting.
- When designing segment values one should avoid using special characters (both parent and child values) since these are more cumbersome for data entry and are more difficult to factor into value ranges compared to non-numeric values. Careful consideration of alpha characters is also advisable, if needed at all.
- It is advisable to avoid numeric segment values starting with zero. When exporting data to spreadsheet tools such as Excel, leading zeros can often be removed.
- Segment value ranges should fall naturally into summary accounts and rollup group definitions e.g. 5 -> 50 -> 500 -> 5000.
- Natural account segment values should be prefixed numerically in accordance to the account type qualifiers so as to be instantly recognisable. A typical structure will include values starting with:
 - 1% = Assets Accounts
 - 2% = Liability Accounts
 - 3% = Ownership/Stockholders Equity
 - 4% = Revenue Accounts
 - 5-9% = Expense Accounts
- The definition of full and whole numbers for the lowest level of segment values used for transactional recording should be avoided, e.g. a natural account value of 11000 should not be used for transactional data but maybe useful as a parent value.
- Segment value lengths should be optimised for data entry.
- Segment values should include sensible ranges or gaps for future inserts e.g. increment natural account codes by 10.
- A single spare/future segment is recommended. The need for any more may indicate a lack of confidence in the original design, although it is not uncommon to see two spare segments within a CoA.
- Segments containing default values that do not frequently need to be changed, are ideally located towards the

beginning or at the end of the account structure, e.g. Company segment in a business with one legal entity at the front and spare segments at the end.

- When defining parent values, the use of “levels” can offer an alternative search capability for grouping.
- Parent values or values defined for summary accounts should not be set to allow posting and budgeting. Posting should occur at the lowest level only.
- Appropriate use of data access sets, security rules and cross validation rules should be considered in complimenting the CoA design.

- Indexes should be created against segments that are expected to have many distinct values.
- Dependent value sets may be required. For example, where account and sub-account segments exist, the sub-account segment values are dependent on values from the account segment and should be filtered for data entry accordingly. This would ideally be reflected within the CoA by using a dependent sub-account value set. Should no dependency exist, the appropriate use of a correctly structured account hierarchy is advantageous.

- By using well defined parent-child ranges any newly introduced values will automatically be picked up and inserted into the relevant hierarchies.
- Rollup groups can be defined to identify a group of parent values for reporting.
- FSGs and other reports should be easily created as a result of CoA design. To reiterate, CoA design should be predominantly driven by outputs.
- Investigate whether ragged value set hierarchies are supported by your reporting tools, and structure hierarchies accordingly.

Conclusions

In closing, a final word of caution. Once an implementation has been completed and the system is up and running, it is important to make sure that the above guidelines are continued to be followed. Strong ownership and control of the CoA is a must, and any changes should not be taken lightly. One of the most common problems Prōject encounters with incumbent systems is not the original CoA design, it is the changes that have been made post-go live, e.g. how spare segments are being used, how additional parent and child values have been added to value sets etc. Many of the principles above are easily broken, and as soon as transactions are incurred, the rot sets in. This can result in complex, inefficient and expensive reporting workarounds. Remember, when making any changes to the CoA; always consider the impact on all outputs first.

Next Steps

Need help or simply want more information? To learn more about best practices for Chart of Accounts design, Oracle's BI Applications or the E-Business Suite in general then please contact Prōject for more information at: www.project.eu.com/contact-us

Prōject was recognised in all of their four nominated categories in the UKOUG Partner of the Year Awards 2012-13 including E-Business Suite and Business Intelligence. ■



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Andy Coates is the Director responsible for the Business Intelligence (BI) practice at Prōject. Andrew has over 8 years cross-industry E-Business Suite experience, 3 years BI experience and is a certified implementation specialist for Oracle Projects, BI Foundation and BI Applications. Andrew is adept at data warehouse and ETL design, is a talented writer of SQL and has an extensive knowledge of the E-Business Suite database schemas. Andrew is an active member of the UKOUG community, presenting on a variety of topics at the conference and throughout the year at SIGs.

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Optimal Oracle Configuration for Efficient Table Scanning

Part Two – Taking the Direct Path

Welcome to the second part of my series of articles on configuring the Oracle database for efficient table scanning. In the first part of this series I focused upon the potentially devastating effect of latency upon throughput, the importance of using large I/O request sizes in minimising latency, and on how to configure Oracle to perform Direct I/O to bypass any buffer caches when using filesystems for data files. In this article I will build upon those concepts and get a little deeper into how the database makes I/O requests for table scans (and indeed fast full scans of indexes).

James Morle, Founder, Scale Abilities 

To Cache or Not To Cache

By the end of the last article we had determined that large I/O sizes and direct access to storage (without any filesystem caching) were a smart thing to do in order to increase our scan throughput. I didn't mention the Oracle buffer cache in the SGA at that time in order to keep things simple, but now we need to consider the SGA and explore whether or not the Oracle buffer cache is a help or a hindrance when we want to scan large amounts of data.

Nobody would dispute that accessing data via a memory-based cache will always be faster than performing physical I/O but, in the case of table scanning, there can be considerable negative side effects. These all hinge around optimal use of memory and the associated trade-offs: Oracle is not designed to be an "in memory" database¹, but rather a cached, on-disk database. Accordingly, many of the algorithms are based upon data blocks being resident in memory for relatively short periods, and for only the most heavily used blocks to remain in cache. This makes perfect sense where the physical memory footprint is a fraction of the database size, which is the

case in most systems because memory is a financially expensive resource.

For Data Warehouses and similar large databases, the volume of data that is being processed will far outweigh the available physical memory, perhaps by several orders of magnitude. For OLTP systems it is typically not a good idea to scan large tables frequently, simply because the associated response times don't fit with those required of an OLTP system (not to mention the associated high system load). But such systems will still require reports to be executed upon the same data, and these reports often suit a full table scan as the optimal execution plan. It doesn't make much sense to cache the whole table in memory for such infrequent use of the data, because this will be at the detriment of other useful data that is vital in servicing highly optimised OLTP queries. So, for both types of system, it is impractical to assume that the whole data set will be cached in memory and we therefore must bite the bullet and go to disk.

In versions of Oracle prior to 11g, all non-parallel data access would go via the cache. In the case of table scans of

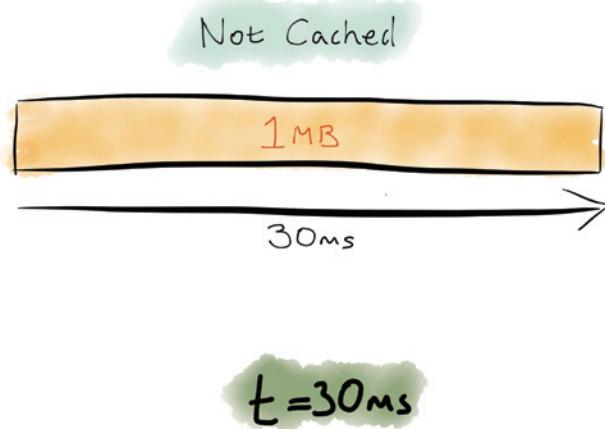
large tables, all data loaded into cache would be done at the cold end (9iR1 and below, from distant memory) or midpoint (9iR2 and above) of the LRU and thus be eligible for aging out sooner than other data. This is a good thing, on the basis that the scanned data is unlikely to be useful to any other sessions in the near future, whereas other cached data that would otherwise be squeezed out by the scan data might be very useful to those sessions. This mechanism doesn't have a formal name, so we'll call it the 'read via cache' mechanism. There are two major drawbacks to this mechanism from an optimal scanning perspective:

1. Additional codepath is required to manage cache slots that are subsequently not reused. This is inefficient from a processor standpoint and might result in additional I/O for other sessions.
2. The inclusion of the cache increases total latency of scan.

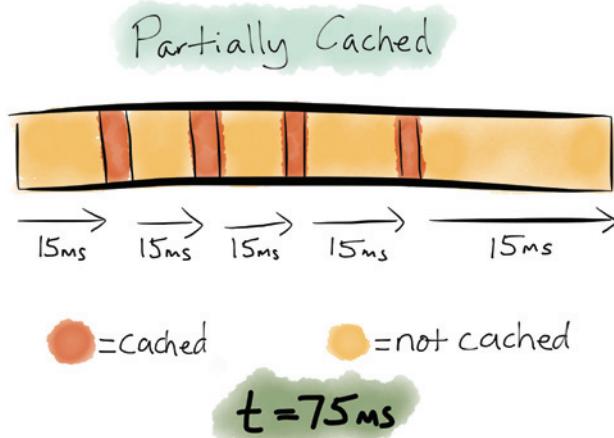
Hang on a minute! Did I really just say that the cache increases the latency of the scan? I did indeed, and for good reason. I'm not saying that a cached read is higher latency than a physical I/O, I am saying

that the implication of the cached reads slows down the rest of the required physical I/O. Here's why.

If we have a reasonably large object of, say, 50GB in size and we want to scan that very quickly using 1MB requests, we would need 51200 I/Os. If each of those I/Os took 30ms that would be a scan rate of around 33MB/s and a runtime of 1536s (just over 25 minutes).



If some of that table were already in cache, however, we would not achieve those 1MB I/Os because Oracle will only physically read the portions of data that exist between the cached blocks. So if we have 128 blocks that comprise a 1MB read (8KB blocksize) and blocks 24, 42, 63 and 85 were already in the cache, we now need to issue five I/Os, each of roughly 10-20ms given their respective sizes. If we assume 15ms average for each, that equates to a total time of 75ms to read that 1MB section of the file.



If the distribution of cached blocks is similar across the whole file, the query would now take 3840s, or 64 minutes (51200 units of 75ms). So this partially cached (3% of the blocks) table is scanned more than twice as slowly as one where none of the blocks exist in the cache. This is just an example, and cached block distributions will vary (often to a greater extent), but it is very realistic. Full partition scans of recent data, where a larger

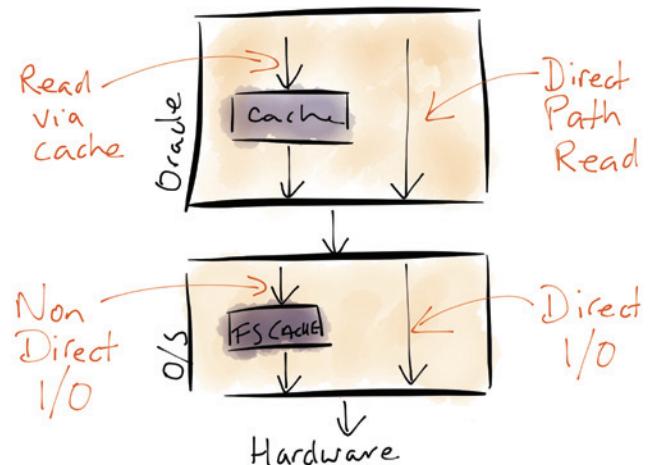
percentage of the data is cached, tend to be badly affected by this phenomena: Large reads are effectively impossible when going through the 'read via cache' mechanism and get broken up into many tiny (possibly single block) reads.

I mentioned earlier that this had changed in 11g, and it has. Specifically, the default mechanism used to scan large tables has changed for serial (non-parallel) scanning to the Direct Path Read mechanism.

Direct Path Read

Direct Path Read is the functionality implemented by Oracle to completely bypass the Oracle buffer cache and to always read data directly from the Operating System. I say "Operating System" here rather than "disk" because Direct Path Read does not specify whether the reads should be via the OS filesystem cache or direct from disk. That decision is left to the similarly (and confusingly) named Direct I/O mentioned in the first part of this article. Direct Path Read has no mandatory relationship with Direct I/O: Both features function completely independently, and work on different portions of the technology stack. Direct I/O is about the method that the database instructs the Operating System to use for servicing requests for data, whereas Direct Path Read is about how the database approaches data access in the first place.

Direct Path vs Direct I/O



In 11gR1 and beyond, Direct Path Read has become the default mechanism, thus enabling direct access to the data without paying any attention to blocks that may already be cached in the Oracle buffer cache. This eliminates the problem highlighted earlier of large reads becoming broken up into many small reads. Everything has its price, though, and Direct Path Read is no exception.

Read Consistency

Reading directly from 'disk' via direct path read has an implication: the versions of data read from the disk do not >>

SPRING 13

Technology: James Morle

necessarily correspond with either (a) the start SCN time of the query, or (b) the latest version of the block which may exist as a dirty buffer in the Oracle cache (or one of the Oracle caches in the case of RAC). This is one of the benefits lost when not reading via the cache - Oracle's consistent read mechanism, which ensures that the version of the block used is correct, is not implicitly applied. Instead, a new method is used to achieve the same result.

The first step that Oracle takes with Direct Path Read is to issue a Fast Object Checkpoint at the start of the query. This is a special type of checkpoint that only flushes out dirty blocks for the specified object. This step alone takes care of problem (b) highlighted above, as it ensures that the version on disk is the very latest version across all instances of the database. Clearly this requirement to checkpoint has a performance overhead as the DBWR process(es) must write out all dirty blocks for that object before the physical reads can start. Though this is generally not a high tax burden for the benefits of a faster scan, this checkpointing has been observed to cause problems

for some applications. The symptom of this causing issues is an accumulation of wait time for the 'enq: KO - fast object checkpoint' event. Once this checkpoint is complete, Oracle can start to physically read data from disk into its PGA memory: None of the reads for direct path reads go into the SGA.

Once a chunk of data (of size 'db file multiblock read count', apart from a few exceptions) is available in the PGA, Oracle must follow the same steps as a normal read consistency: Cleaning out the previous commits and iteratively applying undo data to the block until it is of the correct version corresponding to the start SCN time of the query that initiated the scan. This is problem (a) taken care of, again with a certain amount of tax burden associated with it.

This is effectively a 'private' version of the usual read consistency steps taken during standard reads via cache. It is deemed private because none of the work performed can be used by another process, and none of the results (of block cleanout) are persisted to disk.

Next Steps

Direct path read is certainly not a zero cost option in terms of the penalty associated with it, but the assumption is that the initial setup cost is worth paying to achieve the benefits of direct path read such as guaranteed large request sizes. As we will see in the next part of this series, there are other very pleasant benefits of direct path read when it comes to efficient table scanning which dramatically increase the potential throughput. All of these can be combined with parallel execution to produce an impressive query throughput. ■



ABOUT THE AUTHOR

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Founder, Scale Abilities

James Morle is a specialist large-scale Oracle-based systems consultant with over 20 years experience in IT consulting. James is the founder of UKOUG Gold Partner of the Year winner Scale Abilities. James is the founder of Scale Abilities Ltd (www.scaleabilities.co.uk), co-founder of the OakTable Network (www.oaktable.net), and an Oracle ACE Director. He is the author of the critically acclaimed book *Scaling Oracle8i* and a co-author of *Oracle Insights*. His passion is on getting deep understanding of all the components in the stack, applying that knowledge in solving complex customer problems, and communicating findings in an honest, lucid and candid way.

¹For an in-memory database from Oracle, check out the TimesTen product

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Creating Custom XPath Functions in Oracle SOA Suite 11g

XPath Functions are a library of computing functionalities that can be used to manipulate XML Data. Oracle supports both XPath 1.1 and 2.0 functions in Oracle SOA Suite 11g. Oracle has also provided a collection of custom XPath functions to meet the basic needs of Oracle SOA Suite 11g customers; however it is not limited to this, Oracle has provided a Custom XPath Function Framework to implement custom logic for data manipulation and integration. This article will discuss in detail about this framework and features provided in it with an example and clear step by step instructions.

Kathiravan Udayakumar,
Senior Architect – Technology, Cognizant Technology Solutions

Custom XPath Function is key feature of Oracle SOA Suite that allows extending the functionalities provided by XPath Libraries or creating new functionalities in Oracle SOA Suite. XPath Functions are shared between all the below listed components to access the service data.

- BPEL
- Mediator
- Human Workflow
- XSLT (Implementation Style is different from above specified components)

Figure 1 shows the key components that are required to enable a Custom XPath.

Figure 2 shows the list of steps to be followed in creating and using Custom XPath Functions.

Key Note:

- XSLT Mapper Custom XPath function requires a corresponding public static method from a public static Java class. The Custom XPath function name and Java Method name must be the same.
- XSLT Mapper function namespaces should conform to below namespace `http://www.oracle.com/XSL/Transform/java/package`. `XPathFunctionClass`, where package. `XPathFunctionClass` is the fully qualified class name of the public static class containing the public static methods for the functions.

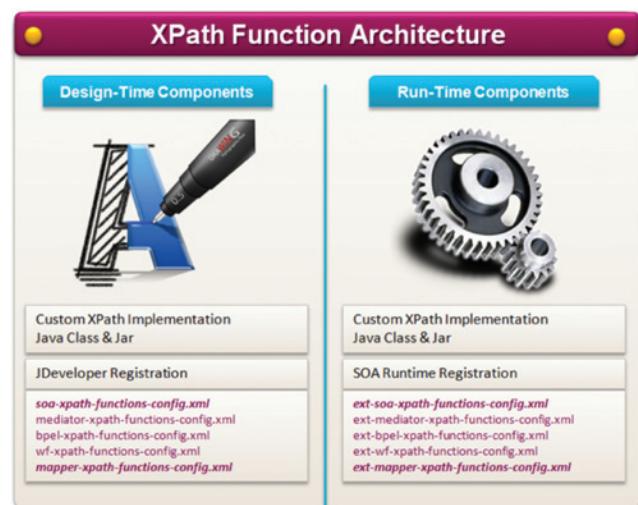


FIGURE 1



FIGURE 2

Step 1: The very first step in implementing a Custom XPath is to implement the required computing logic. Oracle supports use of Java for implementing Custom XPath Logic. This requires implementing certain interfaces that are expected by the Custom XPath Framework. The below code listings shows the custom computing logic for Creating a SOA Header and SOA Logger; readers of this article can implement the required logic by implementing the interfaces shown in the below code listing.

```
package custom.soa.xpath;
import java.util.List;
import oracle.fabric.common.xml.xpath.IXPathContext;
import oracle.fabric.common.xml.xpath.XPathFunctionException;
public class createSOAHeaderString {
    public Object call(IXPathContext context,
                      List list) throws XPathFunctionException {
        String response = "";
        try {
            if (list.size() == 11)
                response = createSOAHeaderStr((String)list.get(0),
                                              (String)list.get(1),
                                              (String)list.get(2),
                                              (String)list.get(3),
                                              (String)list.get(4),
                                              (String)list.get(5),
                                              (String)list.get(6),
                                              (String)list.get(7),
                                              (String)list.get(8),
                                              (String)list.get(9),
                                              (String)list.get(10));
        } else {throw new XPathFunctionException("Invalid Invoke, check the parameters");}
        return response;
    } catch (Exception e) {
        e.printStackTrace();
        throw new XPathFunctionException(e.getMessage());
    }
}
private static String createSOAHeaderStr(String ProcessIdentifier,
String ProcessName, String ProcessInstanceNo, String Application,
String Component, String BusinessObjectName, String BusinessKey,
String DateTimeStamp, String AdditionalAttributel,
String AdditionalAttribute2, String AdditionalAttribute3)
throws Exception {
String SOAHeader;
SOAHeader = "<SOAHeader xmlns:xsi='http://www.w3.org/2001/XMLSchema-instance' xsi:schemaLocation='http://www.companyuri.org/xsd/SOAHeader.xsd' " + " + "
+ "<ProcessIdentifier>" + ProcessIdentifier + "</ProcessIdentifier>" +
"<ProcessName>" + ProcessName + "</ProcessName>" +
"<ProcessInstanceNo>" + ProcessInstanceNo + "<ProcessInstanceNo>" +
"<Application>" + Application + "</Application>" +
"<Component>" + Component + "</Component>" +
"<BusinessObjectName>" + BusinessObjectName + "</BusinessObjectName>" +
"<BusinessKey>" + BusinessKey + "</BusinessKey>" +
"<DateTimeStamp>" + DateTimeStamp + "</DateTimeStamp>" +
"<AdditionalAttributel>" + AdditionalAttributel + "</AdditionalAttributel>" +
"<AdditionalAttribute2>" + AdditionalAttribute2 + "</AdditionalAttribute2>" +
"<AdditionalAttribute3>" + AdditionalAttribute3 + "</AdditionalAttribute3>" + " </SOAHeader>";
return SOAHeader;
}
```

Listing B: Java Class to be called as XPath Function from BPEL, Mediator, Human Workflow to log the messages at INFO Level.

```
package custom.soa.xpath;
import java.util.List;
import java.util.logging.Logger;
import java.util.logging.Level;
import oracle.fabric.logging.LogFormatter;
import oracle.fabric.common.xml.xpath.IXPathContext;
import oracle.fabric.common.xml.xpath.XPathFunctionException;
public class SOALogger {
    public Object call(IXPathContext context,
                      List list) throws XPathFunctionException {
        String response = "";
        try {
            if (list.size() == 12)
```

You can make good use of Java features of method overloading in the Custom XPath Function implementation.

1

Create Custom XPath Function using Java

Listing A: Java Class to be called as XPath Function from BPEL, Mediator, Human Workflow to create a SOA Header String.

```

{
    response = logMessage((String)list.get(0),
                          (String)list.get(1),
                          (String)list.get(2),
                          (String)list.get(3),
                          (String)list.get(4),
                          (String)list.get(5),
                          (String)list.get(6),
                          (String)list.get(7),
                          (String)list.get(8),
                          (String)list.get(9),
                          (String)list.get(10),
                          (String)list.get(11));
}
else if (list.size() == 2)
{
    response = logMessage((String)list.get(0),(String)list.get(1));
}
{throw new XPathFunctionException("Invalid Invoke, check the parameters");}
return response;
} catch (Exception e) {
    e.printStackTrace();
    throw new XPathFunctionException(e.getMessage());
}
}

private static String logMessage(String logMessage, String ProcessIdentifier,
String ProcessName, String ProcessInstanceNo, String Application,
String Component, String BusinessObjectName, String BusinessKey,
String DateTimeStamp, String AdditionalAttribute1,
String AdditionalAttribute2, String AdditionalAttribute3)
throws Exception {
String logMessageetxt = logMessage+
" ProcessIdentifier:" + ProcessIdentifier +
" ProcessName:" + ProcessName +
" ProcessInstanceNo:" + ProcessInstanceNo +
" Application:" + Application +
" Component:" + Component +
" BusinessObjectName:" + BusinessObjectName +
" BusinessKey:" + BusinessKey +
" DateTimeStamp:" + DateTimeStamp +
" AdditionalAttribute1:" + AdditionalAttribute1 +
" AdditionalAttribute2:" + AdditionalAttribute2 +
" AdditionalAttribute3:" + AdditionalAttribute3;
Logger logger =Logger.getLogger("oracle.soa.Logger");
LogFormatter.configFormatter(logger);
logger.log(Level.INFO, logMessageetxt);
return logMessage;
}

private static String logMessage(String logMessage, String SOAHeaderString)
throws Exception {
String logMessageetxt = logMessage+
" SOAHeaderString:" + SOAHeaderString;
Logger logger =Logger.getLogger("oracle.soa.Logger");
LogFormatter.configFormatter(logger);
logger.log(Level.INFO, logMessageetxt);
return logMessage;
}
}

```

Step 2: After creating the Custom XPath Logic using Java; The Custom XPath Framework needs to be notified of such Java class/ custom logic to be deployed to SOA runtime in the next step (Step 3). The Custom XPath Configuration file should be created as (ext-soa-xpath-functions-config.xml) shown below with the required class names added to it as shown in highlighted code.

2

Create/Configure XPath Functions Configuration File

Listing C: Create XPath Configuration File ext-soa-xpath-functions-config.xml and place the content below in it.

```

<?xml version = '1.0' encoding = 'UTF-8'?>
<soa-xpath-functions xmlns="http://xmlns.oracle.com/soa/config/xpath"
version="11.1.1" resourceBundle="oracle.tip.tools.ide.common.resource.IDEMessageBundle"
xmlns:ora="http://schemas.oracle.com/xpath/extension"
xmlns:xref="http://www.oracle.com/XSL/Transform/java/oracle.tip.xref.xpath.XRefXPathFunctions"
xmlns:xp20="http://www.oracle.com/XSL/Transform/java/oracle.tip.pc.services.functions.Xpath20"
xmlns:dvm="http://www.oracle.com/XSL/Transform/java/oracle.tip.dvm.LookupValue"
xmlns:oraext="http://www.oracle.com/XSL/Transform/java/oracle.tip.pc.services.functions.ExtFunc"
xmlns:customXPathSOAHeader="http://www.oracle.com/XSL/Transform/java/com.soa.xpath.createSOAHeaderString">

```

>>

```

xmlns:customXPathSOALogger="http://www.oracle.com/XSL/Transform/java/com.soa.xpath.SOALogger">
<function name="customXPathSOAHeader:createSOAHeaderString">
    <className>custom.soa.xpath.createSOAHeaderString</className>
    <return type="string" />
    <params>
        <param name="ProcessIdentifier" type="string" />
        <param name="ProcessName" type="string" />
        <param name="ProcessInstanceNo" type="string" />
        <param name="Application" type="string" />
        <param name="Component" type="string" />
        <param name="BusinessObjectName" type="string" />
        <param name="BusinessKey" type="string" />
        <param name="DateTimeStamp" type="string" />
        <param name="AdditionalAttribute1" type="string" />
        <param name="AdditionalAttribute2" type="string" />
        <param name="AdditionalAttribute3" type="string" />
    </params>
    <desc resourceKey="createSOAHeaderString" />
    <detail>
        <![CDATA[Create SOA Header, Usage Details: customXPathSOAHeader:createSOAHeaderStr(String ProcessIdentifier, String
ProcessName, String ProcessInstanceNo, String Application, String Component,
String BusinessObjectName, String BusinessKey, String DateTimeStamp, String AdditionalAttribute1, String AdditionalAttribute2, String
AdditionalAttribute3) returns Header String]]>
    </detail>
</function>
<function name="customXPathSOALogger:logMessage">
    <className>custom.soa.xpath.SOALogger</className>
    <return type="string" />
    <params>
        <param name="logMessage" type="string" />
        <param name="ProcessIdentifier" type="string" />
        <param name="ProcessName" type="string" />
        <param name="ProcessInstanceNo" type="string" />
        <param name="Application" type="string" />
        <param name="Component" type="string" />
        <param name="BusinessObjectName" type="string" />
        <param name="BusinessKey" type="string" />
        <param name="DateTimeStamp" type="string" />
        <param name="AdditionalAttribute1" type="string" />
        <param name="AdditionalAttribute2" type="string" />
        <param name="AdditionalAttribute3" type="string" />
    </params>
    <desc resourceKey="SOALogger" />
    <detail>
        <![CDATA[Create SOA Header, Usage Details: customXPathSOALogger:logMessage(String logMessage, String
ProcessIdentifier, String ProcessName, String ProcessInstanceNo, String Application, String Component, String BusinessObjectName,
String BusinessKey, String DateTimeStamp, String AdditionalAttribute1, String AdditionalAttribute2, String AdditionalAttribute3)
returns logger String]]>
    </detail>
</function>
<function name="customXPathSOALogger:logMessage">
    <className>custom.soa.xpath.SOALogger</className>
    <return type="string" />
    <params>
        <param name="logMessage" type="string" />
        <param name="SOHeaderString" type="string" />
    </params>
    <desc resourceKey="SOALogger" />
    <detail>
        <![CDATA[Create SOA Header, Usage Details: customXPathSOALogger:logMessage(String logMessage, String
SOAHeaderString) returns logger String]]>
    </detail>
</function>
</soa-xpath-functions>

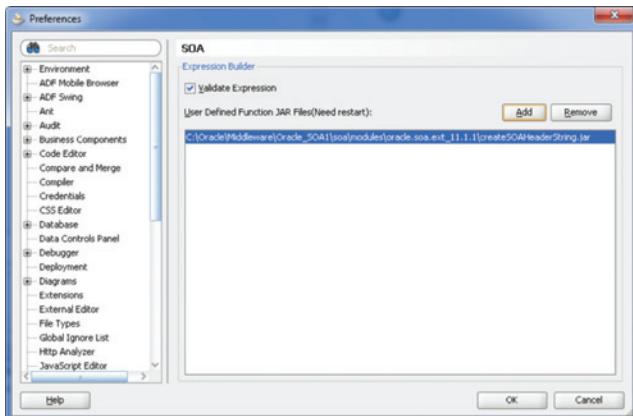
```

Step 3: Once the Custom XPath is implemented; it should be made available in JDeveloper for implementing the code at design time. Steps involved in deploying Custom XPath to JDeveloper are shown in the below section of the article.

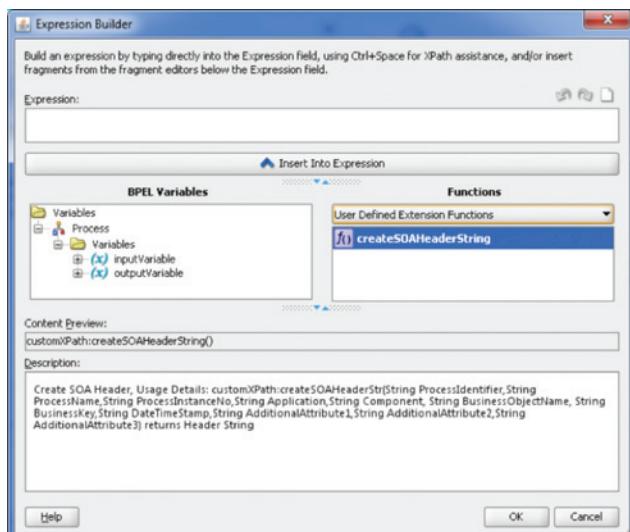
3 Deploy the Jar to JDeveloper

Deploying the jar to JDeveloper has below listed sub-steps; follow the below specified steps to achieve the required result.

1. Compile the class
2. Add the custom XPath Configuration to the manifest folder of the jar to enable the custom XPath function in Design-time Environment
3. Copy the jar to \$ORACLE_HOME\Oracle_SOA1\soa\modules\oracle.soa.ext_11.1.1
4. Configure JAR to Oracle JDeveloper as shown in Figure 3 screenshot



Custom XPath can be accessed from the XPath Expression Builder with Functions column as “User Defined Extensions Functions”



Step 4: This is the last step in the process of completing the XPath Execution. For the runtime to identify and execute the computing logic, the Custom XPath Jar file needs to be deployed to SOA Runtime. Restart SOA Suite Admin Server for the changes to be effective.

4 Deploy the Jar to SOA Runtime

Conclusions

Custom XPath are the easiest and simplest technique available to extend the feature of Oracle SOA Suite. Typically Custom XPath implementations are listed below for the benefit of the reader.

- SOA Logger Implementation (Logging Business/Critical Alert Messages from SOA Components such as BPEL and Mediator to SOA Console/File/Databases)
- SOA Header Creation Implementation (SOA Business Message Headers to track and trace the message flows across different SOA Components)
- XML Comparison Implementation (Comparing two XML Messages in SOA Components)
- Integrating Oracle Coherence with Oracle SOA Suite. ■



ABOUT THE AUTHOR

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Kathiravan has 9 years of IT experience. He has extensive experience in architecting and designing solutions using various Oracle Fusion Middleware and PeopleSoft Products. Kathir works for a highly reputed IT Consulting Organisation and is a key member of the Fusion COE team.

He is the author of the world's first book for Oracle SOA Certification, entitled "Oracle SOA Infrastructure Implementation Certification Handbook" (1Z0-451).

Other books on Oracle SOA Published by the author are , “Oracle SOA Patterns”, “Oracle SOA Frameworks”, “Hello World to Oracle SOA – A Complete Guide to Oracle SOA Suite 11g” and “Oracle SOA Suite 11g Administration and Performance Tuning”.



Optimising Finance Shared Services Through Oracle Fusion

Current trends in industries across verticals indicate that delivery of finance and accounting operations as a Shared Services model has gained considerable momentum in optimising the structure of the finance functions and drive business operations.

Srinivasan Ayyamoni,
Principal Consultant,
Infosys Limited

Though research points to significant realisation of benefits from Finance Shared Services centres, there is still untapped potential to shore up business performance by focussing on the technology enablers available in the market place. Organisations are increasingly looking to achieve Finance business transformation through the Shared Services model as opposed to the traditional 'as-is' transition of processes from spoke to hub. The broader and grander scale of the Shared service programmes encompasses business transformation initiatives to ensure adoption of optimal finance models and to sustain continuous process improvements. Oracle's Fusion financials has incorporated new functionalities and improvised a number of features to help organisations achieve optimal return on investments from its Shared service centre programmes. This article intends to highlight such key functionalities that will bring in significant process improvements and cost savings in the longer run.

Share Services enablement Features in Oracle Fusion Financials

Oracle's Fusion is a compendium of standardised solutions in accordance with accepted industry best practices aimed at achieving finance business transformation. Given below are key issues that confronted by Shared service centres (SSC) and how Fusion addresses the same in Share services model for financial processes:

1. Consolidation of Disparate Ledgers Based on Legal Entities

Operational Constraints

Traditionally separate ledgers are created based on country specific requirements

and management reporting needs. This spawns the need to represent a same transaction under multiple balancing segment values. Balancing segment is the level at which trial balance and financial statements for a company are generated. The end result is creation of separate ledgers based on different chart of accounts structures.

Shared model in Fusion

In Fusion General Ledger, companies can look to consolidate ledgers per country and completely do away with the need to have separate ledgers to handle management reporting. Fusion supports up to 3 balancing segment values in the Chart of Accounts structure. Apart from one balancing segment representing the legal entity, there can be two other segments that can act as secondary balancing segment values.

2. Reference Data Model

Operational Constraints

An organisation having multiple business units/divisions maintains and uses individual reference data such as Payment terms, Revenue recognition rules, Receivable collection strategies etc. The rules are defined and managed individually for each business units.

Shared model in Fusion

Fusion provides functionality to create flexible model of shared reference data that will enable business units to re-use the reference data. By creating common reference data by line of businesses as opposed to enterprise specific ones, organisations can aim to standardise the usage across all its business units and avoid duplication in maintenance.

3. Shared Chart of Accounts

Operational Constraints

Best practice for a multinational organisation is to enforce a Global chart of Accounts (COA) across its operations. However most of the traditional ERP applications do not ensure enforcement and adherence to the global structure when local versions of the COA for various entities are created within the system. This results in dilution of the philosophy over a period of time resulting in multiple versions of chart of accounts that the organisation has to cope with.

Shared model in Fusion

In Oracle Fusion General Ledger, the chart of accounts (COA) model is framed around the concept of a chart of accounts structure, under which one or many ‘Chart of accounts structure instances’ can be created. Effectively, an organisation will have one Global COA structure referenced by the multiple COA instances which will be assigned to the individual entities. This ensures that all COA instances share a common shape and have same segments in the same order

4. Shared Financial Reporting

Operational Constraints

The biggest constraint faced by a shared financial reporting team is excessive reliance on spread sheets or third party reporting system to perform and monitor the period end financial reporting. Manual control will have to be in place to monitor the adherence to the planned financial calendar events.

Shared model in Fusion

Fusion Financial Reporting Centre offers a holistic view of Financial reporting for a distantly located SSC and provides a single point of access to securely distribute live and pre-published financial reports via self-service access. The key elements of the centre are:

- General Accounting Dashboard helps tracking the financial period close based on pre-defined rules. Users will be guided on what to do, where to go, and who to contact aspects of period close. For example, it provides quick resolution point of contacts for posting errors, account reconciliation issues etc.
- Account Monitor monitors specific account balances in real-time throughout the accounting period

to identify aberrations on real time basis. This also ensures centralised management of risks by the SSC

- Smart View provides framework for SSC users to perform ad hoc balance queries within a familiar Excel spread sheet environment in a structured manner by accommodating data from multiple data sources.

5. Automated Invoice Processing

Operational Constraints

Accounts payable management often forms the core activity of a Finance SSC. Any process breakdown can result in barrage of calls from suppliers. Therefore the focus of the Payables management team should ensure that there is an efficient trail and traceability of documents received from suppliers, eliminate invoice processing errors, quicker turnaround and reconciliation. In reality though, considerable manpower is spent in processing paper invoices. Some organisations implement scanning solution to improve the traceability aspects – but are always bogged down by the challenges involved with integrating ERP systems with third party scanning software.

Shared model in Fusion

Fusion payables offer imaging integration as a mainstream functionality which facilitates automatic scanning and intelligent optical character recognition of supplier invoices and employee expense reports and receipts. The solution supports high volume transaction processing from a centralised SSC and the forms recognition feature extracts data from the invoices, sorts and routes the invoices based on predefined rules to the relevant payable processor queue and populate the data in the AP invoice entry user interface. As a result, AP team gets to focus only on exceptions and process improvements rather the constraints faced by a typical manual payables operations environment.

6. Central Payment Factory

Operational Constraints

Disbursement functions in a SSC environment often is segregated from the mainstream payables processes to ensure effective internal control. However a centralised structure takes away the

flexibility and control for the individual business units and divisions in an organisation to manage and control cash flow. This flexibility is especially critical during the times of uncertain economic situation wherein a business unit would like enforce control over who and when to pay. In order to achieve this requirement, many large companies engage non-strategic third party service providers to centralise disbursements.

Shared model in Fusion

Fusion payments offer the ‘Payment factory’ model which offers a unique combination of ‘decentralised’ invoice selection process and ‘centralised’ disbursement. This ensures that the business units have independence to control the payment selection process and at the same time, it also reduces the central payment processing costs by pooling payments across business units into fewer disbursement files.

7. Rule Based Revenue Management

Operational Constraints

Revenue recognition process is of paramount importance for an organisation from the perspective of both financial performance as well as accounting compliance. Auditors identify revenue recognition as an audit sensitive process for their year end and quarterly audit/review procedures. Considering the criticality, this function is usually driven as a decentralised finance function.

Shared model in Fusion

Fusion Receivables offers rich rule based revenue recognition engine to implement centralised revenue recognition solution to achieve accuracy and timeliness. It is possible to define revenue recognition policy incorporating time-based schedules, contingency events – all configured based on the applicable GAAP. When a transaction is entered manually or imported through the auto-invoice process, Receivables assigns revenue contingency to the transaction based on the applicable policy and defers or recognises revenue. Centralised Rule based revenue recognition ensures real-time visibility and closure of revenue recognition process across the business units of an organisation. >>

8. Financial Close and Account Reconciliation Management

Operational Constraints

During period close, Finance Shared service centres have to cope with complex tasks absorbing intense efforts in a short time frame. Typical challenges faced by an SSC during period close are –

- Absence of single view of transactions and visibility to real time status
- Efforts to manually track and follow up of tasks
- Dependencies on external transaction processing systems

In summary, there is no system available to centrally track the period closure across business units.

The account reconciliation process – primarily for Balance sheet accounts - is another periodic activity which requires concerted effort to achieve timely closure during the period end. Finance SSC generally leverage on a combination of Excel spread sheets, E-mail in addition to manual tasks to manage these processes.

Shared model in Fusion

Fusion edition of Oracle Hyperion Financial Close Management is a centralised, web-based application that manages period-end close activities. It helps in the management of all financial close cycle tasks that typically include General Ledger and Sub-ledger close, Data processing, Financial consolidation, Account reconciliation, Tax reporting, Treasury activities, Statutory reporting and compliance. It is integrated with Microsoft Outlook and tracks the tasks through Business process management workflow. It has two elements to manage these crucial aspects:

Financial close manager: As a task management solution, it itemises the various tasks that comprises of the period close. These tasks can span across external transaction systems, General ledger, Sub-ledgers like Inventory, Purchasing, Payables, Receivables etc., Financial Consolidation system and External reporting system. Every task has an owner attached with due dates set on recurring basis every month. It has inbuilt capabilities to identify and flag off constraints and blockers in the process using pre-configured dashboards for monitoring the progress of the financial close.

Account Reconciliations Manager: This functionality requires all the

identified accounts to be assigned with a reconciliation preparer, reviewer and approver. End user procedures for performing the reconciliation can be recorded in the pre-defined template. Once the templates and schedules are fixed, the account balances data is loaded from General Ledger for executing the reconciliation tasks. The assignee must perform a reconciliation which provides evidence of the balance or substantiates balance calculation. Monitoring is performed through a dashboard form, which provides visibility to where each reconciliation task is within its lifecycle, who is currently responsible for the reconciliation and when the reconciliation is due.

9. Centralised Risk Management and Assurance

Operational Constraints

With an increasing number of non-traditional tasks getting managed through Shared service platforms, organisations face immense challenge to have a robust risk management and assurance framework. Often they get bogged down with the below constraints:

- Need to embed controls within business processes thereby resulting in redundancy and higher costs.
- Excessive reliance on manual tasks resulting in occurrence of frauds/ process breakdown

SSC faces risks ranging from duplicate payments, billing errors, transactions with unauthorised suppliers. Therefore there is a need to identify potential process vulnerabilities and enforce controls to mitigate such risks.

Shared model in Fusion

Oracle's Fusion Governance, Risk, and Compliance (GRC) Applications deliver advanced detection and analysis tools that continuously audit, monitor transactions and controls across key financial processes. It provides three key types of controls:

Access Controls: Analyses and detects Segregation of Duties (SOD) violations and remediates such violations. As a preventive measure, it enforces compensating controls and performs What-if simulations.

Transaction Controls: Identifies violating policy such as unauthorised suppliers, detects risk patterns. Additionally, it can have pre-configured rules to validate

transaction data before scheduled processes, mandating approvals to transaction data based on thresholds.

Configuration Controls: Detect and maintain audit trail of changes to sensitive master and reference data such as bank account numbers. Also enforce preventive steps such validation/approval prior to making such changes.

Conclusion

Shared services centres in the Finance area are increasingly becoming mainstream establishments for large organisations due to their ability to gain expertise in automating repetitive transactional processes.

The key to success for efficient Shared Services at an organisation level depends on a robust and flexible technology platform - a platform that is secure, flexible, scalable and reliable. Fusion applications offer state of art features specifically from Shared services perspective blended with the industry best practices and reflecting the needs of changing business environment. Large organisations will immensely benefit if they translate their Finance Shared Services operations into Finance Business transformation programme based on Oracle Fusion platform. ■



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Sri is a Chartered Accountant with 15 years of professional experience in IT consulting spread across industries in Retail, Banking and Manufacturing. As a Principal Consultant at Infosys, he has been part of many Business Transformation engagements based on Oracle and PeopleSoft applications in Financial Management and Procurement areas.

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- Dermot O'Kelly on UK Oracle User Group**: 36 views, uploaded 3 weeks ago. Description: Dermot O'Kelly, Senior Vice President, Oracle UK, Ireland and Israel Technology gives 3 reasons why a UKOUG membership is a must for Oracle customers.
- Exhibiting at a UKOUG Conference**: 16 views, uploaded 3 weeks ago. Description: If you offer products or services to Oracle's customer base, there's no better place to show what you can do than at a UKOUG Conference.
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15 minutes

with
Cliff Godwin

Senior Vice President,
Application Development,
Oracle

12.1.3 E-Business Suite and Beyond...

An Interview with Cliff Godwin, Senior Vice President, Application Development, Oracle

Interviewed by Debra Lilley, Council Member, UKOUG

I'd like to start with the E-Business suite question around upgrades. The 11.5.10 customers, how many people have now moved to 12.0 and what's going on with that at the moment?

Well basically our support data indicate that about two thirds of the customer base is active on Release 12, either 12.0 or 12.1 at this point. And based on feedback we get from the user groups and other mechanisms we think most of the rest of the customers have a plan to become active and move on from 11 to 12. So, at this point, most people are either upgraded or are actively working on a project or at least have a plan to do it in the next year or so.

What would you say your favourite feature of the next release of E-Business Suite is?

Well, the next release of the E-Business Suite is 12.2 and the really great feature in 12.2 is Online Patching. So, online patching is something that our customers have been asking us for, at least for most of the 22 years that I've been doing work with the E-Business Suite. So, finally it's really exciting to be able to deliver it. So, online patching means that you'll be able to have users continue to use the system while patches are being applied and then just take a brief outage to restart the system and point it to the patched version. So it will be a huge reduction in planned downtime which is something in particular our manufacturing customers and people with international operations with users all over the world really care about a lot.

I saw an example of that at Open World and it was just fantastic. We've had so many long conversations over the years where customers have said it just takes too long to patch. So that will be very, very exciting for a lot of people.

Yes, it's been very exciting because we're leveraging some database technology and this is over the years we've always talked about E-Business Suite benefits running in the Oracle database and this is probably one of the best examples ever of that. So there's an underlying database technology called Addition Base Definition that we're using for this online patching feature. We couldn't build this feature without that database and without depending on that database feature. So we've changed our applications patching approach to take advantage of that underlying database capability and that's really what the 12.2 release is mainly about.

It's a bit of tease that, when the technology has the ability to do it and the DBAs get all excited and then they have to wait for the application to take use of it. So you've been teasing them for a little bit!

We've been teasing them for quite a while on this but, as you can imagine, given what's at stake we're being very careful about when we release it. So we're making sure we've got everything very solid in development and then even as we start going into the customer base with 12.2 we're going to encourage a very measured so that we're making sure that people are successful with it and there's

Version



Interview was conducted in December at UKOUG Conference 2012

**Pictured left: Cliff Godwin and Debra Lilley
Pictured right: Cliff Godwin**

no surprises before we encourage people broadly to go onto the release. So I think it will be worth waiting for but we're going to be careful before rolling it out.

So, one more traditional upgrade and then this wonderful no downtime feature. We're really looking forward to it.

Online Patching. Yes, so basically, it won't help you get to 12.2 it will help you once you're there get to subsequent patches.

At Open World, I saw a fantastic presentation of the Endeca product with Enterprise Asset Manager which I really liked, and you showed us it with Order Management. Have you got any other examples of where you're going to implement Endeca within E-Business Suite?

We've recently released a whole set of use cases of integrating extinctions that we've built with Endeca into the applications. So you mentioned Enterprise Asset Management and Order Management, we already have discreet manufacturing inventory in terms of item search, purchasing products, a number of other cases. So, I think there are already 8 total product areas we've already released some extinctions for. And, we're just going to keep going. This is very productive, we're able to build these capabilities very rapidly so you're going to see a lot of very rapid advance from us doing more with Endeca as we go forward.

And are they version dependent?

Right now we can build the Endeca capabilities to integrate to the current

release so you don't have to wait to take a new version of E-Business Suite to get these capabilities, you can be on 12.1.3 of E-Business Suite and then set the Endeca server up on the side and take an applications patch that has the versions of the screens that have this integration and you're good to go. So, we'll be doing it for 12.2 of course as well, so 12.1.3 or 12.2 and then as we do new capabilities we'll release both versions so that people who are on 12.1.3 or 12.2 can take advantage of it.

And what are your customers saying about it?

People are very excited. We've got very good perception and people have been very eager to get this. I think everybody, there have always been things that have been frustrating to do with the user interfaces that are available, and this gives you a way to get right to the work you want to do very quickly. In a lot of cases people have been building operational reports for things like 'what are my top priority orders' or 'which asset should I work on now', and they're concerned that an operational reporting problem, 'what are all the project tasks that are given resources assigned to things that are not necessarily easy to query up in the screen turn into operational reporting requirements. One thing that I'm very optimistic about is that there's these Endeca based solutions that give you so much flexibility browsing through the data that a lot of the work that people have had to do building operational reports can be put aside and people can

just use those interfaces to find the work that they want to take action on.

I love it when you see the different areas of Oracle coming together and at UKOUG 2012 in our Community Keynotes we had two at the same time that were talking about Endeca, so that was the big news of the BI and that was a big part of the E-Business Suite.

Endeca is fantastic technology and we originally bought it with our CRM product lines in mind to help improve the web store shopping experience that we could make available for customers that want to implement those customer experience solutions. And we've integrated the Endeca technology into the BI group so a lot of those nice search behaviours that we have in Endeca can be brought into the BI technology stack as a whole and benefit all of the BI offerings that we have. But we found that Endeca as a separate company had built interesting use cases for a lot of ERP scenarios, not just the CRM scenarios, and so when we got together with them and understood what they'd done we thought well you know we can build that straight into this application and all of our customers can get that scenario because we can do the integration for them.

I'm quite interested in what kind of cases your seeing coexistence with Fusion applications.

Yes, so we've talked about coexistence scenarios with E-Business Suite and a variety of our other Oracle products, things like Adula Primavera that require products

SPRING 13

Interview: Cliff Godwin

as well as the new Fusion applications, and so probably the most popular one I'm seeing right now is in the HCM area. For people who haven't integrated E-Business Suite a system that's both Finance and Human Resources, a lot of people could take advantage of the Talent Management offerings from Fusion to complement that. It's pretty straightforward integration to do things like performance appraisals and compensation workbench in Fusion and then take the results of a compensation round and put those back into the core records in E-Business Suite and go forward with the payroll that reflects those changes. So, the most common use case is really with people embracing that in the Cloud. To basically do a Cloud deployment of the Fusion Talent Management products, alongside what's typically a Premise, E-Business Suite interaction. So I think that's a good example of both how to coexist E-Business Suite with Fusion and also of how to support a hybrid scenario where some of your applications are on Premise and some of your applications are in the Cloud.

And what's really nice is the end-user doesn't know any of that. They don't know where it's being deployed, they don't know what application they're in, they just getting a better use of their IT. I'm a firm believer in the applications unlimited message, what are your plans beyond that release?

We're going to keep going with E-Business Suite, we don't have any plans to stop, and we've spent a bit of time now with the technical work of getting 12.2 out, which is really more on the technology side changing the patching mechanism, and one of the things we really want to turn our attention to after we get 12.2 out is to do a whole set of feature-bearing releases that are easy to consume, so roll-up releases like 12.1.2 and 12.1.3. were on top of the 12.1 baseline. We'll do a 12.2.2, a 12.2.3., a 12.2.4 and so forth to deliver a lot of the enhancement requests that users have been asking for. So, that's actually an opportunity to talk about the value of the user group because how do we figure out what enhancements we want to build in those releases? That's really a function

of what the customers are asking for and we have a lot of direct engagement with individual customers of course but one of the key inputs for that is the Special Interest Groups, the feedback from the user group, because we really want just to build the things that customers want to see in the products. So the mechanisms that the user group provides for consolidating that feedback and validating that this is really the right set of priorities that the customers want to see across a variety of industries and so forth, is really how we make those decisions.

That's music to my ears, I love to hear that user groups are of value to you and they're of value to our customers as well. Let us know the things you are thinking about and you know we'll give you our feedback on that. It's just great for us to be part of that journey.

It's an essential part of our process. We really exist to serve the needs of the customer community and certainly the user groups are the critical forum of bringing all that together. ■

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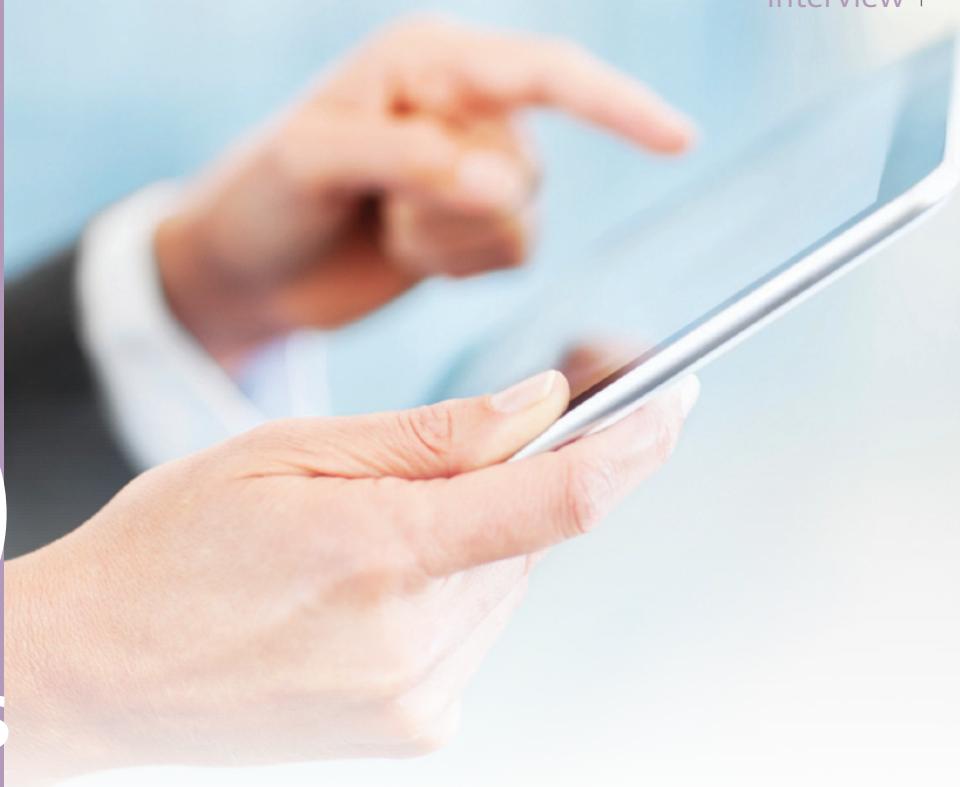
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15 minutes

with
Jeremy Ashley
Vice President,
Application User Experience,
Oracle



User Experience and How it Makes Applications Easier to Use

An Interview with Jeremy Ashley, Vice President,
Application User Experience, Oracle
Interviewed by Debra Lilley, Council Member, UKOUG

Jeremy, I'm part of the User Experience (UX) Advocates programme that has been looking at the project Fuse and the Mobile Apps, can you tell what it is that you're doing at the moment?

Well, we're actually in a very interesting time. We have the first version of Fuse out there and, of course, we've spent many years working with our customers to really get those flows, and to get that product out there and to really understand what enterprise applications need to be like now and what they are going to be like going forward. We're working on extending that now to understanding how, not just technology is changing, but also how society is changing in regard to their reaction to technology. If you look at many users

nowadays, many of our customers, many of the types of tools they are using have changed significantly just in the past 3-5 years regardless of going back like 10 or 15. So, much of the work we are doing is around being able to look at the right solutions for those situations.

You know we're being asked for those sorts of things all the time, you know, 'give us a mobile app for our conferences', we wouldn't have had that request a few years ago, so I can understand that things are changing all the time.

Yes, the world has changed considerably; if you consider 10 years ago cell phones were only really taking off in the States, maybe 12 years ago, and, as such, changed communication as we know it.

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Six years ago, when you were designing Enterprise Applications, really, many companies were designing around larger screens, remember we were getting these cinema aspect ratio displays...

... ah, 'my display's bigger than your display'...

Exactly! But, of course, 3.5 years ago the iPad came along and the market that had previously been a niche market, started to become the dominant method of people communicating with their enterprise systems. So, how would we take these systems which had a very particular perspective and were designed a particular way, and putting them into those types of other devices is like going from one direction or larger, totally 180 degrees and making experiences smaller. And to be honest, from a user experience perspective, that is totally the right thing to do. In any user experience you should be there trying to get to essentially what the user needs to do not adding all these other extra features on at the same time. So it's allowed us to start designing very efficient user experiences.

So, I like it and I've been sharing that with people, and the question that I get asked every time is; 'have you rewritten Fusion already?'

No. The work that we've done with our real entrance experience into Fusion is that it is just Fusion itself. It's built on the same ADF, it's built on the same middleware, it comes off the same view objects, the new simplified experiences that we're producing are a reaction to the new devices that they need to be on but they're based 100% on the existing

applications we have on Fusion and they use exactly the same technology, no new services, no new layers, no new anything like that at all. It is just Fusion.

So you're looking at what people are doing, what are the trends that people are using, the sort of experience that people need and are expecting, so what are the other things that we could be using, that we could be looking at next?

Well, we are definitely in a major transition phase. Technology has speeded up in regard to its innovation, that nowadays a new product can come out in a week's time. Also, with ubiquitous WiFi, power supplies that can last for days or weeks, and many other types of innovations, technology has become more personal. If I was to look at myself, the number of devices I carry now, I've got a book reader, I've got a tablet, I've got a phone, soon I'm going to have a watch, maybe I'll start having glasses, technology is around me in shopping malls and aeroplanes and places like that. We are becoming increasingly integrated with our environment, in regard to these devices and their inter-connective nature. And that's going to be fascinating for enterprise applications going forward. It's not really about mobile meaning a mobile device, it's now about how we move through spaces, how we go around and do our job, and how the environment can assist and react accordingly.

I like all of the things you've done, and the way that you work with customers and understand what it is that they're doing and how it is that they want to be able to do things, even when sometimes

they don't even know, and I've been privileged to see all of that. It's great that you bring your labs to our user group so that we can take part and be part of the process. Are you sharing the information you've gathered and what you've learned with the wider Oracle technology community?

Almost certainly! So, my team is a central resource across all Oracle applications, we also run labs around the world, out of the organisation, and Oracle has a much larger user experience community and we all work together and look for every opportunity to collaborate. Also, we do work around, not just coming up with common guidelines for standards, but creating usable, consistent, not just components for user experience, but whole flows or meta-components, what we call design patterns that really build good user experience in at the core level in the code which our internal developers and our customers can use to build good, usable experiences for their own products.

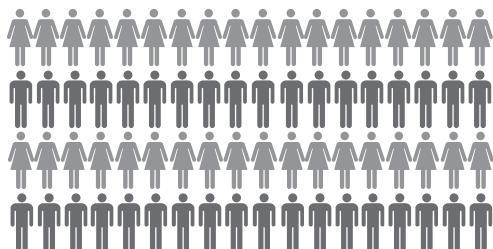
I'm always saying to people, look at what Fusion Apps is doing, because it's that window on that technology and you're exposing all of the things that people can do with that technology.

You know we're looking to make sure that all the good bread and butter stuff in regard to putting together applications, we support that for good experiences, and it gives our customers that ability to spend more time coding the bits of experience that will make their products special for their particular use or company. ■

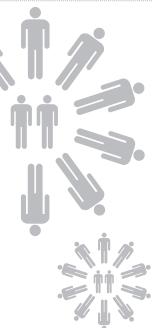
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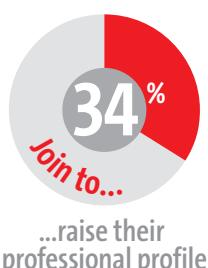
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15 minutes

with
Arian Stijf
Oracle E-Business
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Arven

Oracle BPEL Explained for Oracle E-Business Suite & More

An interview with **Arian Stijf, Oracle E-Business Suite Specialist, Arven**

Interviewed by Dev Nayak, Chair of the UKOUG AIM SIG

It's an exciting time to be in the Oracle E-Business space. There's a lot going on, Oracle Fusion on the horizon, people are at a crossroads to move from 11 to Release 12, and part of that cycle of change is something under the bonnet called BPEL.

What is BPEL?

BPEL is short for Business Process Execution Language. Originally, it was designed to coordinate Web Services, at one point the service oriented architecture came into being with services being offered by different systems and every system would offer a number of services and we needed a way to call all the services in the right sequence. BPEL was designed to call those services, get the results back and based on that, call the next service.

So it's a way to impose order on all the web services coming into our architectures. How have you seen customers using BPEL?

Of course, the way it is meant to be, calling web services in a certain sequence. But, lately we see BPEL playing a much more important role where it is the architect controller for a whole wider system. So, for example, you have a purchasing process, and BPEL will control every step in that process, from the moment a customer calls placing an order a BPEL process will start and it will orchestrate all the steps needed until the goods are delivered and the cash is paid.

Would it be accurate then to say that BPEL is going to replace Oracle Workflow?

You are quite correct in that. In 2006, Oracle de-supported the stand alone Workflow product and the Workflow product is only still used in E-Business Suite. The replacement for Workflow is BPEL. As of Release 12.1, Oracle put BPEL in the E-Business Suite. So, we can expect in the next few releases, more and more of the Workflow functionality will be taken over by BPEL.

So is BPEL the next generation of Workflow or is it a completely different product?

It's not entirely the next generation. There are too many differences in the technology. Workflow can do things that BPEL can't do and the other way around.

Are there any shared components? Was BPEL built on some of the existing technology from Workflow?

No. Workflow has always been a proprietary product from Oracle and BPEL was an international standard language. So, Oracle has extended BPEL with its own extensions, but it is entirely different technology and on the technology part it has nothing in common with Workflow.

Is BPEL available now in 12.1?

Yes, it comes out of the box with E-Business Suite 12.1. If you are on an earlier version you can do a separate installation of the SOA Suite and that comes with BPEL.

So, as a user of Oracle E-Business Suite, should I be thinking to move my workflows to Oracle BPEL right now?

You will have to start thinking about it. It is probably too early to say ok, panic mode. But you will expect in future releases more BPEL functionality. So if you are developing, or if you develop, new workflows, you will have to make a conscious decision, am I still going to do it in Workflow or migrate to BPEL?

You make a very good point, so if I was adding an additional customisation, I'd need to think carefully whether I should do it in Workflow or BPEL. What are you seeing happening with your customers?

It depends on how they use their current Workflow products. It also depends on how comfortable they are with new technologies. If you see customers who have a lot of interfacing with E-Business Suite, so E-Business Suite interfaces often with other systems and Workflow is used somewhere in that process, people will be more likely to move to BPEL.

That reminds me of something you said earlier, that BPEL is an international standard. Does that make it easier for BPEL to talk to other systems?

Yes, BPEL is really designed, well, as I said earlier on, it is orchestrating web services, so that is what it does best, calling other systems and requesting their services. Unlike Workflow that is more focused inside, it is running in the database, it is running in E-Business Suite and you will need to make a bit more effort to make it talk to other systems. For BPEL, talking to other systems is natural, and everything that needs to be done inside the system is a little bit more difficult.

How do we get from Oracle Workflow to BPEL? What does that mean to us?

There's not going to be any conversion. There's not going to be any upgrade tools. The only thing to make life a bit easier is that Oracle will migrate little by little. It's not going to be that Oracle announces that, from the next release on, Oracle won't do anything with Workflow, all your Workflow apps are de-supported and not used anymore. You can expect Workflows little by little to be replaced with BPEL technology, so you will have time to catch up with them.

So all the vanilla workflows that are currently inside E-Business Suite, is Oracle

migrating them to BPEL?

That is up to the product development teams and I think each product development team will consider which workflows will go to BPEL or if there is another technology that might be better suited.

At the moment in 12.1 we've got Workflow and BPEL. Do you have any sneak previews of what's coming in 12.2? Do they still have both?

Not much more than you do. The only thing I know is that Oracle will still support Workflow. They've even made a number of improvements to the Workflow engine which is good news for us. At the same time they are going to put in more BPEL processes. So there you see the future for the next few releases, we will have Workflow and BPEL and we will see which product teams favour which product and which direction they'll be heading.

Can we expect to see the Oracle Workflow product in Oracle Fusion?

That is a definite no. The reason is very simple. Oracle Fusion Applications is designed to be a suite based on open technologies. Workflow is a proprietary product so it won't make it into Fusion Applications.

That gives us a clear picture of why Workflow is being replaced by BPEL, in removing those proprietary technologies to something much more service orientated.

Yes, it is really about open standards, the BPEL is really an international open standard. It would be possible to replace the whole BPEL process manager, that is the component that runs the BPEL processes, with a BPEL process manager from another supplier. There is just one catch, those are the extensions that Oracle builds into the BPEL product. When you use BPEL with E-Business Suite, you get E-Business Suite based extensions, so you can call the APIs from E-Business Suite immediately, you get some security from E-Business Suite automatically, all those things.

It's pre-integrated into the product, but if you wanted to use another third party BPEL you could do it but you'd have to do all that integration yourself?

Yes. But it is possible because it is an open standard. So if you already have some architecture in place with a BPEL process

manager you can still use that one and integrate E-Business Suite with your current, existing architecture that is not Oracle based.

We're working with a customer that already has a service-orientated architecture and as such have already got another third party BPEL engine, what would they do when they want to interface with E-Business Suite? Because they've got the choice to use their own third party engine, or what other options do they have?

You can also put two architectures next to each other. It is an option but I wouldn't advise it because SOA architecture to BPEL process manager is really the heart of the architecture of your whole infrastructure. Having two of them is like having two infrastructures, it's like putting two networks in your office.

So that's a no-brainer. If you have Oracle E-Business Suite, you're going to use Oracle BPEL, but would you use it to interface with another third party BPEL or would that be an opportunity to simplify that part of the architecture and just use the Oracle BPEL engine?

If you would ask Oracle, they would say it's a no-brainer, use Oracle. I think, when you look at real life, there will be a mixture. Quite a number of customers will probably use a third party BPEL process manager and take the extra effort, like it's not impossible to connect E-Business Suite with a third party BPEL process manager.

Do you see that being a viable option?

Yes, you just have to do a bit extra work. You don't get the nice add-ons that you would get with the Oracle BPEL process manager. But the E-Business Suite, for some releases now, has had the XML gateway for interfacing with web services, so you can connect through the XML gateway with any SOA architecture that you have in place.

Now one thing that's on a lot of people's minds is, I'm an Oracle Workflow developer, and I've got BPEL coming down the line. What does that mean for me?

I would take a development course first and learn. People coming from the SOA architecture world and the web service world are much more focused on Java and XML while Workflow is almost entirely PL SQL.

So is that a piece of advice to Oracle E-Business Suite developers in general, to add Java to their PL SQL experience?

Yes, that goes for any E-Business Suite developer, you see that about ADF and now BPEL, they use a lot of Java so it's getting more and more difficult to develop on the E-Business Suite without knowing at least a bit of Java. I'm not saying that you have to build everything in Java yet, but you will have to have rudimentary skills about Java programming.

Sometimes when we talk about service-oriented architectures and Java, it makes us think about different ways of organising our projects, whether that's around Agile development or scrum technologies and as E-Business Suite people we're really used to the Waterfall Prince 2 methodology, do we think that some of these cool, new Agile technologies might creep into our traditional Waterfall projects?

I wouldn't be surprised. But that depends quite a lot on the site that you are working on at your customer. It's a choice of development method. For E-Business Suite it will not be made because of technology, it will be based on what the developers are comfortable with and what the customer wants in the results. At the moment I am working with a customer, who is very impatient, he wants results yesterday, so even within PL SQL, we chose a rapid development method. So they will have a very quick prototype and then we will start the building on top. So the customer decided the development method, not the team.

I like the way you put that, that makes a lot of sense. The technology shouldn't determine how we do things, it should be 'what do we want to achieve and what does the customer really want'. So I'm an Oracle Workflow developer, now you've mentioned that I should start looking at Java, and when it comes specifically to BPEL, is it a very different

product to develop with? Maybe to give an example, one of the classic workflows is one that you referred to at the beginning of our conversation which was the purchasing workflow. It exists in every Oracle E-Business Suite environment. If I'm a Workflow developer, how would I do that in BPEL? Is it completely different? What are the tool sets I've got available?

Well, BPEL is usually developed in JDeveloper, you can also use other development tools, for developing BPEL but the Developer has the standard BPEL plus the Oracle extensions available. So it's the tool of choice when using the Oracle BPEL process manager. When you are comfortable with the general concepts of workflow, when you can model a business process in workflow builder, you will get set on BPEL very quickly. There are some important differences; one of the most important ones is the structure of the flow. In workflow the branching out, branching in, making decisions can be done within the activities. In BPEL, you have to specifically say, 'ok now I'm going to make a decision', 'I'm going the left or right', it's a separate function that says 'here I'm going to split', it's a separate function that says 'ok I'm going to branch out', so you have to be much more specific, explicitly model all the decision points that may be in the workflow.

When it comes to developing, do I develop at the same speed, or, how does that work?

I think that once you get the feel of BPEL you can develop at least at the same speed. Some things are easier, some things are a little bit more difficult to do. But BPEL is a very flexible tool. When you have reached a decision point in BPEL, you can have any information available to make that decision. You have database functions that you can call, you have all the variables in the process that you can call, and you just drag and drop those together into a function that says a logical true or false for example. So then it's just

drag and drop rather than going into PL SQL and writing out a function for it. On the other hand, you have to be much more specific about all the parameters that you have available. When you have a function, the function will not be able to access your runtime data any more, it will not know where in the BPEL process it is. So, if you need that information, it's a parameter to your function. So that takes much more time, you have to specify all the inward and outward parameters.

So BPEL is available now in 12.1, can I use it in Release 11?

You can, but it doesn't come out of the box. You will have to make a separate BPEL installation, install the SOA Suite separate next to E-Business Suite, and then you would still use the XML gateway to connect to your BPEL. It doesn't integrate as tidily as in 12.1. In 12.1 it comes out of the box and has a full repository with all the functionality of E-Business Suite available. So it is possible, but unless you have SOA in place already, I wouldn't advise you to go there.

What would your advice be to current customers now knowing that BPEL is coming along the line? What are the things that should be on my road map or forming thought process to be ready and match fit?

I would take a look at the SOA architecture and identify where you can use it to connect the E-Business Suite to the rest of your infrastructure, to your other systems. And I would also already start investigating the process modelling like, 'ok how do my processes already really run across my systems'. That is information that you will need.

And that's a business analysis activity actually...

Yes, and that is information that you will need when BPEL comes into place. And that will be the basis to start. And in the meantime, it also wouldn't hurt to catch up on your Java. ■

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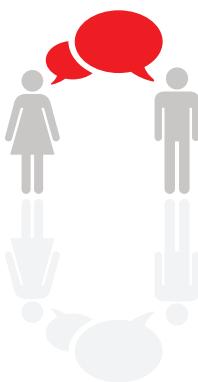
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