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ORACLE®

Adapting to Ever-Changing Technology with a Complete Enterprise 2.0 Solution

Contents

Executive Overview

In today's dynamic global economy, the ability to be agile and responsive to change is more important than ever before. Information and the interactions around it have become the key assets of most enterprises, and making correct decisions in shrinking cycle times is the defining operating characteristic of winning companies. The market imperative to access the right information and people at the right time has led to an increased interest in building a next-generation enterprise workplace environment where users conduct day-to-day business tasks. Such a workplace leverages Web 2.0 technologies and usage patterns to transition the enterprise to an Internet-powered, user-focused, and community-centric social fabric that ties together people, ideas, content, processes, systems, and enterprise applications.

Bringing Web 2.0 capabilities and services to the enterprise is about more than just the latest technology; it's about changing the traditional business model and tapping into the creativity, intellect, and passion of every single employee. It is much more important for companies to understand the changing trends in business than to just implement the next "hot" technology product. Companies need to foster the development of new ideas, tap into critical employee thinking and knowledge, and enable the synergy of teams to revolutionize their existing business models and achieve lasting success.

The goal of this white paper is to help define what Enterprise 2.0 is in terms of the value it can bring to an enterprise and to relate this to the capabilities that technology can deliver.

Introduction

For more than a decade, investment in Information Technology has centered on automating internal processes with the aim of reducing costs and improving operating effectiveness to support a business model aimed at delivering 'more of less' in largely stable markets. Today, many aspects of those markets have changed; driven by a deadly mix of Globalization, increasing competition, a shift towards new media as the source of information, as well as stronger demands for localization and customization. What has resulted is a new model—emphasizing 'do less of more' and speed to change in order to compete against these forces.

As the ability to save on costs encounters the law of diminishing returns, the enterprise focus for using technology is shifting towards external goals that can lift revenues, market share, and margins. Additionally, the evolving nature of global business and the network of relationships companies have with external vendors is being reconfigured to derive competitive advantage and increase profitablity. Optimizing the relationships with suppliers, customers and partners is proving to add more value to organizations than focusing internally on the costs of operating internal processes, where the law of diminishing returns is making it increasingly difficult to achieve a real breakthough. Adding value through entering new markets and adding new services, means increasing revenues and profits, which in turn can lead to increases in shareholder value.

These new and very different business requirements recognize new and different technologies and capabilities, delivered in new ways and at different time scales. The focus is now on people, communications, and collaboration, not computers and data. This joint whitepaper authored by Capgemini and Oracle is about these new factors, what they mean, how to view them against new goals, and the relationship between external 'Business Solutions' and internal 'Information Technology,' which remains the ongoing blanace of any business enterprise.

Issues in the Market Place Today

Over the past few years, there has been an increased interest and discussion about innovation in technology and its use by business, but why and for what purpose has been difficult to determine. Today, a range of pressures has forced out key issues and problems that must be dealt with for both survival as well as prosperity. Businesses have been subjected to a number of severe shocks and changes. Time has increasingly become the new issue in how quickly business can adapt to change. The ability to recognize events as opportunities or threats is being altered and there is a shift in the time and costs for IT to deliver new requirements. What we see from all of these changes in technology, business, global markets and expectations is the need for a new approach—the need to focus on becoming an Enterprise that has mastered how to use Web 2.0 as an operational environment and the use of Enterprise 2.0 as the tools to achieve this.

Changes in Business Activities

Recently, businesses have been subjected to a number of severe shocks and changes. The credit crunch made it difficult for companies to borrow because lenders were scared of bankruptcies or default—sresulting in higher rates and an increase in the price of debt products for borrowers. The globalization of competition has made it clear that to be successful in global markets, firms must not only understand their potential buyers, but also learn to compete effectively against other firms from many different countries. Commoditization has forced businesses to offer differentiated benefits to their target markets and redefine their business model strategies or they run the risk of being stuck in the quicksand and aren't able to get out. Mass customization of products has revolutionized the way goods are bought and sold. And finally, customer expectations of online services have drastically changed as new technologies emerge and customer needs evolve.

In the stable markets of the early nineties the business mantra was to do 'more of less' —to use Information Technology to focus on operational improvement around the most significant products and activities to increase volumes sold and market share. Customers accepted that choice was constrained to what was 'sold' in their area. Today, when the Web allows immediate and direct comparison of specifications, price and delivery, the shift towards specialized and customized choice requires enterprises to be more flexible in their products and services, with the result that the mantra is to do 'less of more'. A shift that requires the ability to not only be flexible internally, but also externally in using the same capabilities to work with the enterprises' suppliers, alliances and partners.

And these changes aren't the only things impacting businesses. The technological impacts of social collaboration and networks, the arrival of the cloud and ubiquitous connectivity have enabled users to collaboratively create, share and recreate knowledge from multiple sources, leverage collective intelligence and organize action. It's becoming clearer that it's imperative for businesses to embrace these trends in order to survive. Choosing and using the right technology in the right way has once again become a genuine source of competitive advantage.

How do we harness these forces of change? In examining the factors that are driving the need to 'do things differently' and to 'do different things' it is immediately obvious that the factors are all part of external market issues crossing the boundary in one form or another to impact the enterprise. However good we are with internal administration and cost management by the use of Information Technology, it cannot be enough to tackle these drivers which call for real 'innovative' change.

Enterprise Reaction Time

Market stability has traditionally driven the benefit of investments from a 'back office' point of view. IT, Accounting and Human Resource departments are concerned with reducing operating costs and eliminating unnecessary expenses to increase profitability and company value. There is also a need for compliance, data monitoring and system integration to maximize on existing investments. While this traditional view continues to be true for the back office areas, where legal or audit requirements apply, external conditions are no longer stable and change is happening at a rapid pace. The need for 'front office' agility in response to these conditions is ever-increasing. Market shocks such as globalization and commoditization and the rise of competition are making "time" the new priority. Change in organizations needs to be made rapidly without the consequences and dependencies of existing IT systems and their data. As time has increasingly become the new issue in how quickly the business can change, companies need a flexible and adaptable way to react to changes in processes and changes in the marketplace.

Processes drive the business. If you execute a sales order, escalate a hiring decision, decide which records to keep, or determine how to price a product, you are acting within an implicit or explicit business process. Portions of these processes take place inside IT systems; for example, a logistics application might coordinate the transportation of goods from Singapore to Los Angeles. But systems only go so far. People and their experience and expertise are the informal components of the business process that can truly make the difference between good and great. In the case of shipment goods, it means efficient use of the process and procedures available by externally being able to complete and register documents. To be great means the ability to not just monitor progress, but in the event of an unexpected event such as a hurricane, delaying arrival. Additionally, being able to collaborate rapidly with a range of people and information to determine options and execute an alternative plan is essential to keep a flow of goods into the market. This results in maintaining revenues and market share.

The ability to leverage the expertise and knowledge of people to truly make a difference through using collaboration and flexible orchestration of business processes based on Web 2.0 technology is a further hallmark of Enterprise 2.0. And this, of course, leads to the need for an equally flexible provisioning structure in the technology infrastructure too—the deployment of virtualization and cloud based technology.

Formalizing processes—defining steps, exception handling, escalation paths, and coordinating the systems needed to accomplish a specific task—greatly improves productivity, compliance, and quality of service. However, efforts to formalize and automate informal business processes can be challenging, as processes span divisions and IT systems. Adding to the challenge, business users are often disconnected from IT developers. Business process management has a unique way of solving these issues and provides a set of tools for creating, executing and optimizing business processes. It enables collaboration between business and IT to automate business processes and enable organizations to be agile and flexible and thus more responsive to change.

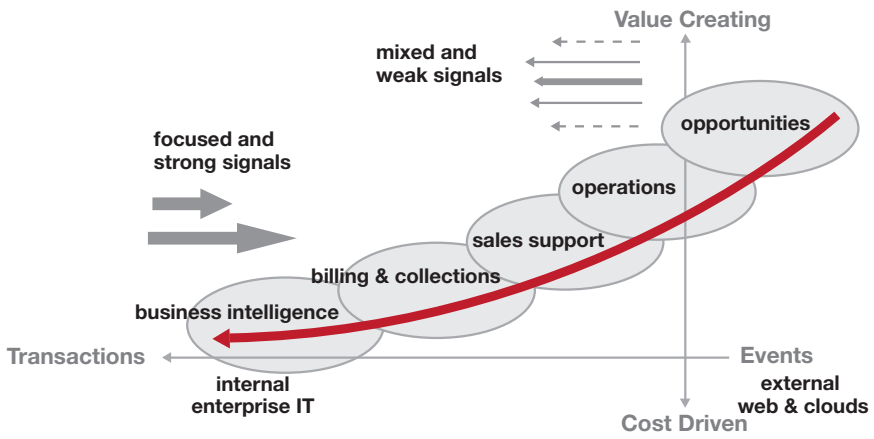
The biggest challenge of all is to be able to make all of these elements function as a single integrated whole, supporting every aspect of an enterprise in a comprehensive and cohesive manner. To achieve this requires both a business model to determine how the various business functions should relate to each other and a technology architecture, together with a product set, that allows this to be implemented. The manner of implementation is yet another differentiator, as with these two elements, implementation will take place through a series of quick, strongly focused moves that target where and how to get an immediate boost to critical business success factors.

Events: Opportunities or Threats?

In a mature market when there is little to no opportunity to expand the relative size of an enterprises' market in the short term, the optimization of operations to maximize returns and efficiency in the existing market is crucial. Therefore the use of traditional Business Intelligence (BI) as the reporting mechanism on past efficiency achieved in relationship to budget set is a crucial success factor.

In a relatively steady and unchanging market, BI assures success by measuring what needs to be measured and reported in order to ensure the success of the defined goals. This can be referred to as 'focused and strong signals' because the focus and use is clear to all concerned; it is reporting on what we have decided that we need to know about our internal operations. Unfortunately, stability and lack of change are two elements that are conspicuously lacking in the global markets of today, added to which is the social and technology changes that are creating new ideas, waves, and markets—almost overnight in some cases.

Figure 1: Identifying and qualifying opportunities to increase revenue and margins.



These are the 'opportunities' to achieve 'stretch targets', or even to adjust positioning and the current business plan and budget, but the information is difficult to understand and factor into use as it is comprised of 'mixed and weak signals'. As an example, what signals did the rise of the iPod and iTunes send to the music industry? The signals were there in the market that change was definitely occurring, but the BI of the Music Industry was monitoring its sales of CDs and didn't react until these were impacted, by which point it was probably too late. Too late meaning the market had chosen to change and the new arrival had the strength to fight off the late actions of the previous established players.

In emerging and growing markets, the numbers and types of opportunities in the market are significant success factors and we see the focus changes. The need now is to identify and quantify each opportunity as to the potential to win revenue, grow margins or increase market share. If we follow the cycle in the diagram from the external side that means being able to harvest weak signals, make operational decisions on choices, and build wining sales responses. All of this is before the shift into the Book to Bill cycle to fulfill, and at the end, the BI reports on how the enterprise is performing against budgets.

As you can see, the shift from traditional BI reporting is moving away from the role of centralized IT to a more decentralized approach based upon cutting-edge Business Solutions and Enterprise 2.0. Rather than thinking of traditional BI, it's a case of using new tools to be an Intelligent Business. In order to do this, organizations use the capabilities to harvest information from external sources via the Web and mix that with the signals that its people are picking up in order to analyze and interpret change and options. Most of all, its having the ability to operationally execute quickly and effectively on this flow of business and market intelligence.

Justifying Investments in Technology

As we move forward, more and more company managers are looking towards how they can accelerate out of the recessionary conditions and their current impacted markets while still achieving cost savings. Companies need to recognize that this is not a defensive move; rather it is an aggressive move in order to take back revenues, margins and market share and is based upon improving relationships with customers, suppliers, and partners.

The focus on understanding and entering new markets that are being created in every sector, such as the equivalents of the music industry or airline industries, shifts to embrace new forms of customer interactions and expectations. Customer expectations are rising and they expect not just better service, but more customization of products and services to suit their exacting needs in new or innovative ways. Addressed with the right tools internally, these expectations create new revenue streams, better margins, and above all, improve customer satisfaction with increasing repeat business. Enterprise 2.0 combines the use of the Internet and Web 2.0, to leverage people and their expertise in valuable relationships. To give you a better idea of this concept, let's take a look at some examples of how two companies have experienced new market opportunities arising from new technologies.

We'll first look at the Amazon Kindle, a software and hardware platform for reading electronic books (e-books), developed by an Amazon.com subsidiary in 2007. Since then and based on projections of the results already seen in 2008, market analysts decided that the boost to revenues and profits was worth nearly $9 billion of extra value to the Amazon capitalization. Amazon's normal retail operation of revenues and profits would suggest $16 billion. But with the additional $9 billion produced by the Kindle, Amazon has a current market capitalization of $24 billion –14 times above earnings of the standard retail sector.

The Kindle uses 3G Wireless to gain Internet connectivity and place a customer in direct real time communication with Amazon. Through this link, customers also gain access to the opinions of thousands of other Amazon customers on various books. Amazon has now succeeded in combining all the elements of Enterprise 2.0 together—real time communication, crowd sourcing and social networking, to leverage the knowledge of people, and interactive real time selection of options. However, Amazon also relies on its existing IT systems to handle book to bill, dispatch, and database and information management.

A similar example, tying together new devices, people and information to produce new revenue streams and value, comes from General Electric, who is competing for a share of the truck and trailer leasing market in North America. In order to remain competitive, they created GE VeriWise™ trailer telematics and GE VeriWise™ truck telematics systems—industry leading technologies which deliver outstanding on-board information and analytics. This allows for users to understand exactly what the truck, trailer and load are doing and where. The launch was fairly low key, but from this has grown a services business based on the GE VeriWise™ division acquiring all the monitoring information from an ever growing fleet of truck/trailer units travelling across North America, and then cutting and dicing the information to be able to reuse it, or resell it to a wide range of transport operators. Once again the key is that the customers are prepared to pay for the equipping of their trucks with VeriWise in recognition of the value that this flow of previously inaccessible information provides. Because of this, market entry and creation is directly funded by customers, including Wal-Mart and the US Postal Service.

These examples illustrate how new markets with extra revenues and profits can be created when you connect people and technology together using these new capabilities. The traditional view of technology, connectivity and people, has been limited to internal Enterprise applications as the source of 'information technology.' The shift needs to move to connect people and technology together, both internally and externally, and focus on building an Enterprise 2.0-enabled organization that leverages the entire business ecosystem. The justifications for investments also needs to change and be based less on cost and more on the direct returns generated by sales, profits and market share.

Challenges in the Market Place Today

In order to remain competitive and survive in the ever-changing market place today, organizations need to find a balance between saving money and enabling change. In the mid nineties, when the explosion of new solutions were built around networked PCs, businesses caused enterprise level problems in recreating a coherent picture of exactly what was happening and what data to base actions upon. The solution then was a lot of work to standardize the basic approach to the use of PCs, Operating Systems, and Applications to deploy ERP. Put simply, this type of approach can't happen again. It's not just the cost, time and embarrassment to sort it out, but compliance and standard issues that need to be adhered to as well.

So the question is what exactly do you do, to both allow the freedom of market and user based 'innovation' with new technology and to 'lock down' the existing IT systems for cost management purposes? It's all about focusing on building an 'enabling layer' and funding it from the savings made in making the necessary changes in the areas it impacts. The enabling layer must address four key elements: content/data/storage management; network based services; Service Oriented Architecture (SOA) based operations, and security of elements.

- **Content/data/storage management.** The cost of storage and archiving is much higher than most enterprises realize, though they do realize that they seem to be continually buying more storage, and that demand will continue to rise. So its time to look at the cost of provisioning, virtualization and XAS. Also, as part of this is the management of what is stored, where and by whom. Users increasingly want to create, use and store huge amounts of semi-structured data, and this is best controlled in terms of how much and where it is stored more than by managing the actual taxonomies and other traditional tools. The ability to identify and strictly manage the use of key structured data is necessary for survival.
- **Network based services.** We tend to think of the term networks in terms of the provision of connectivity. Over the years this has grown from the original analogue based network, to adding LANs, to embracing digital point to points, to WANs, and finally into Internet pipes. Most networks could do with a rationalization around what is needed to support business today, and that also means the massively expanded use of 'standards' that support 'Web' based services that are part of the network. But this is at a much higher level than basic connectivity. What we see is the increase in SaaS, the shift to cloud computing and the emergence of Telepresence are all relying on this.
- **SOA based operations.** There has been a big focus recently on virtualization, and for the big applications it pays off, but the challenges are two fold; one is to provide a safe 'buffer' zone between these crucial enterprise applications, and the other is to provision and operate cost effectively the increasing shift towards small 'appliance like' solutions. SOA is both the way to connect what needs to be connected in a controlled manner between the 'innovations' above, and the way to enable a coherent series of processes through orchestration in this new world. At the same time, this shift towards supporting a rapidly increasing number of services based solutions that change continually doesn't support basic

virtualization techniques, so advanced management of the high number of small specialized systems by using the techniques developed for supporting SOA is both a cost reducing move and an enabling move.

- **Security.** The increasing opening up and externalization of business around the Web, SaaS, and even just simple email has already created many new risks and challenges. Many CIOs are rightfully wary of allowing users too much of a free hand due to these risks, but the business wants, or even needs, this freedom to operate in the open market. Consolidation of security management around different elements has to happen, and that introduces the risk management of the elements in the manner of Jericho style security. The innovation around the edge ceases to be a risk to the rest of the enterprise.

Front vs. Back Office: Who's in the Driver's Seat?

The traditional role IT plays in operating internal business processes and activities is to achieve results at a low cost. The challenge with this today is that with increasing regulation, this is a non differentiating activity where the question of 'how much does it cost' serves as a benchmark against competitors in the same industry. We also see suggestions that it's not worth investing more, but instead there should be a switch to using what you have 'better'. The goal therefore is to get as much use as possible out of what you already possess.

How can enterprises get the most out of under utilized assets in most businesses; i.e. the expertise, knowledge and experience that employees contribute to maximizing profits? Some organizations know this challenge very well and are trying to 'develop' business opportunities and make sales, or deliver across supply chains indeed – but their definition of how to do this still means investing. Cadbury Schweppes has been able to take 35% out of the cost of re-deployment of new components and has reduced the time to deliver new capabilities– but think of this the other way round. What is the value of being able to get more competitive capabilities in place sooner? Every week that a new capability is delayed equates to an amount of lost revenue and margin. People know this is happening, they complain about being unable to do the new things that matter, but it's difficult to harness this into value.

We need to address cost management and utilization of the hardest assets to manage, i.e. people, with the tangible benefits to their cost base of providing the necessary support services for their product at industry bench mark levels, and the value to selling more to their customers that comes from best in class marks for 'service support'. The realization is not to focus only on the usual factor around the cost of providing and operating the IT systems, but also to look at using a different type of technology placed in the hands of people and business users to maximize their potential to make profits.

Remaining Flexible While Reducing IT Costs

We've seen recently is that it can be extremely difficult to quickly deliver cost cutting methods and frequent change in organizations, while still remaining flexible. Too often the answer seems to be to outsource everything, but such deals will not help with the need to use technology innovatively to support market operations. Change needs to occur quickly and oftentimes, the CIO is seen as either the enabler of supporting rapid change, or as the person or department that is holding everyone else back. If the CIO isn't the enabler of change, who else is going to do it? And how do you ensure change occurs quickly?

Quick and fast development of small, high impact projects is one place to start. The speed with which the use of Web based tools is occurring at the edge of the business in an unsanctioned manner is increasing. The need for agile development and updating existing systems is also prevalent. The maintenance of existing systems is an ongoing problem and over the years, it can be quite costly. But as

productivity enhances towards both cost cutting and supporting the business, it may be the time to take a look at this issue. However, adding or changing development tools is not something to undertake lightly, but there are offerings available that can help. Organizations need a complete, open and manageable enterprise portal framework that integrates Enterprise 2.0 capabilities directly into business processes, portals and applications to create richer connections and deliver faster time-to-value. Having a unified, standards-based portal platform that supports the creation of all styles of Web sites, portals, and composite applications is critical to delivering a platform for innovation. Possessing these capabilities can help to enable business users to easily evolve these applications and enable change within the organization.

IT and Business Alignment

How well are the IT and business organizations aligned in your company? This topic has been going on ever since the term and the technology of IT, PC based systems was coined in the early 90s. Before that, you just had to do it the way the computer needed it to be done. But now, the gap between IT and the business users is widening fast, and it's not even about alignment, it's about two completely different focuses.

With the advent of the PC and Network technology that introduced the term IT in the early 90s, (replacing the previous term of 'computing', or 'management information systems'), a revolution in business practice was introduced. Before IT, business operations were separated into departments, each with their own Mini computer recording the transactions that their work produced as a sort of automation of the 'filing cabinet'. This necessary separation of work and expertise meant that the flow of process across an enterprise was broken up and sub-optimal. The IT revolution and networked PCs meant that Business Process Re-Engineering could take place so that core processes could be optimized across the enterprise in an end-to-end manner. However, this required flexibility in the way people worked beyond the departmental oriented model, so Matrix working accompanied this change.

The key to Matrix working was that a person performed their defined role in what ever processes required this role to participate in. The main point was that the processes and roles were predetermined because the whole enterprise worked in a pretty stable manner, with changes happening at a slow rate. The business school mantra was 'do more of less' and by focusing on the handful of products that made your enterprise most of its money, it enabled you to dominate a specific market area through specialization. The way to make more profit and gain competitive advantage was to become so efficient in your chosen product by optimizing and automating the processes that supported it. Thus increasing your margins, and so beating everyone else. To do this required IT assistance. Ultimately, IT was producing genuine competitive advantage.

Successful IT is based on cost reduction of the processes required to administer the product lines in a business that uses centralization, stability, and core focus as the major drivers to market success. Against this background, investing large sums of money in monolithic applications that take some time to deliver makes sense as the stability of the overall model means that paybacks are assured. Add to this the chaos that the business experienced with the introduction of PCs and consequentially mass copies of data—all different, all over the place. Before the IT department was created, there was no way to make sure that one version of the truth existed. What resulted were clear objectives for the IT department today; get cost down, centralize data and keep core processes clean.

Today, business is facing a very different world, one where stability is going, or in some cases, even gone. Global competition has increased the range of products available, and consumers, or business buyers, know how to use the Web to find exactly the product they want without the restrictions of locality. Beyond this is a whole shift in technology, and its use by people, to the extent that many people have more and better technology capabilities at home than at work and are frustrated with the IT department. A combination of factors that has not gone unnoticed by the Business Schools, and has led to them introducing new 'best practices', by combining new technology capabilities with the changing market conditions, just as before.

The focus is now on flexibility, using the new wave of Web based technology to move rapidly to optimize responses to market events and opportunities, laying increasing emphasis on the ability to assemble expertise to quickly evaluate and decide on a course of action. This coupled with using electronic trading practices to cut the cost and time in managing supplier relationships leads to the maxim 'do less of more' in a complete reversal of the previous proposition. For example, the BMW Mini has literally almost endless degrees of customization, yet is highly profitable, allegedly more so than the conventional BMW 3 Series that has a controlled series of options. This is in part because the customers will pay more to get exactly what they want, and in part because the suppliers are working together in a new way across 'business networks' to be able to support such flexibility.

New Approaches to Driving Revenue

Companies recently want and need to find ways to improve the health and effectiveness of their innovation programs to gain the necessary competitive differentiation. This is a direct consequence of global market trends increasing competition and adding new competitive features and ways of doing business online. It is increasingly clear and understood by CxO level executives that growth will not come from doing 'more of the same', nor from focusing solely on cost cutting. The engine of growth is change through innovation. There are a few basic approaches to driving revenue growth: finding new markets for existing products; extending the revenue life of products in their current markets; finding new applications for technologies or methods; and entering adjacent markets.

Understanding how to develop strategic innovation competence is a critical success factor for companies. Whether it is the every day innovation needs of the enterprise in finding new ways to define and execute on operational excellence or the strategic 'Big I initiatives' around developing new products and markets, innovation is the elixir to drive the health and success of the company. Globally, companies are critically reexamining what they are doing to establish sustainable, high performance innovation as a value-driving core competence of the organization. It's essential for all companies to follow in these footsteps to survive and thrive.

Making Resources More Useful

Bridging different data and systems is essential for an agile and intelligent business; however traditional technologies that bridge these various systems do not go far enough. The impact of Web 2.0 technologies in consumer-facing Web sites, such as blogs, wikis, tags or social networking, has led organizations to realize that these technologies can add significant value to the business. To some, it's difficult to directly measure the benefits achieved when increasing people's ability to communicate and share information. The same problem emerged back in the 90s, with the universal adoption of email. Today it is understood that email is a necessary element to support Matrix working, but the ever-increasing rise in email traffic is the indicator that we need to recognize that a shift in the way we

are all working is occurring. The rapid changes in markets, products, events and customer requirements are all conspiring to increase the need to find answers outside of the 'standard' procedures.

Another important concept that has been introduced recently to help organizations maximize on their resources is 'cloud computing.' Cloud computing comes into focus only when you think about what IT always needs: a way to increase capacity or add capabilities on the fly without investing in new infrastructure, training new personnel, or licensing new software. Cloud computing helps to extend IT's existing capabilities and connect users within the organization. The use of cloud computing is yet another way for organizations to expand their network of relationships with suppliers, customers, partners and each other to increase profitability, reduce costs and remain competitive.

It's Time For a Change

As we've seen, businesses need to understand and adopt Enterprise 2.0 in order to survive with the challenges they are being faced with. The questions that remain become more focused on how and with what products, which are the topics of the next two sections.

Most organizations already have systems and methods in place that have been developed over the years that support business processes and contain invaluable knowledge. These 'legacy systems' typically continue to be used because they still function for the needs of the business, even though newer technology or more efficient methods of performing a task are now available. Some regard legacy systems as a barrier to development and growth, but it's important to recognize that legacy systems don't have to be a problem. If your legacy systems integrate together to provide a complete and comprehensive offering, you can utilize this to your advantage.

There isn't a one size fits all approach to handling legacy systems. When planning a path moving forward, it's best to recognize that there are actually three separate activities and development paths:

1. Technology for cost containment
2. Revenue-making business services and activities
3. New technologies to support business requirements

The goal of the separation is to ensure that each gets developed to separate goals to maximize their capabilities for the enterprise, as this is more effective to achieve than a full on portfolio rationalization.

The first group focuses on using technology for cost containment where the controlling, or management issues, are predominantly based on technology issues. Here the decisions are based on change affecting the cost base positively, or negatively, as an example whether an upgrade should be implemented on the basis of reduced operating cost, as there is no business functionality case. The ultimate question for this group, the real 'legacies' that are unlikely to change, is should the enterprise be operating these things at all, or should they be treated as 'utilities' and put out to be operated externally as part of an exercise to continue to drive costs down.

In the second group are those things that are business services where there is a very direct link to revenue making business activities with the pressure for change driven by Line of Business managers requiring changes to functionality. It's not only that these applications will continue to change; it's also likely that they will become the ones that may at some stage be required to be integrated with new Web based solutions. However, there is a further defining feature that separates this group from the other two groups, and it's the extent to which they are enterprise 'transaction' based. As an example, an order entry system is an enterprise business activity that will require periodic changes, but its role is based on data integrity, and its integration with other systems is through data. Upgrades

and changes need to be a balanced decision on several criteria, but at the end of the day, operating efficiency is the overall criterion.

This makes the description of the third group as those critical business activities based on 'interactions', or process centric, easier to understand. In this group are the solutions that really are not legacy at all—they are the newer systems dealing with information, 'real time' decisions, and events. This is the group that will continue to expand, probably rapidly, and its here that it's possibly to take full advantage of the new technologies to support business requirements. But just think about this for a moment, it's the interfaces between the groups that are the places to base rationalizations upon. Between the first and second groups it's a mixture of customized and Enterprise Application Integration (EAI), where as between the second and the third, it should be Service Oriented Architecture (SOA).

The goal is to standardize the services exposed from group two in such a way that the processes in group three can be extremely flexible and can connect through SOA to group two applications without any new implications. Now portfolio rationalization in group two can be based on the cost, time, and difficulty of exposing the services as a logical program for modernization.

A New and Different Approach to Integration

Too much money is spent on expensive integration and subsequent operations; in fact, some analysts estimate as much as 80% of the IT yearly budget may be spent this way. The problem is that the legal and auditing demands for enterprise integration and transactions are rising, and failure to meet their standards is not an option. Taken all together, this leaves too little money to invest in doing the 'right things' for the business. With the added demands of having to comply with new accountability, privacy and financial transparency regulations, combined with ever-increasing security requirements, businesses today are wrestling with IT challenges that are all too real.

Businesses are looking to middleware to protect their investment in legacy applications and hardware, while delivering the agility needed to compete. In the past, middleware usually came bundled with a specific application, with the express purpose of integrating it with an enterprise's IT infrastructure. Today, middleware comes to market as suites of modular components that provide greater value beyond integration. IT relies on middleware to develop, deploy, secure and manage Web services as well as utilize business intelligence, portal, identity management and content management capabilities to gain greater control and transparency in running their business.

Today, middleware is enabling companies to improve customer service, segment and market more effectively to their customers, cost-effectively consolidate IT operations and increase the ability to respond to change, bring new efficiencies to business processes and operations, and increase overall profitability.

Rich, Dynamic and Simple User Interaction

In the last decade, business has seen the rise of collaborative enterprise technologies, from groupware to portals and team communities. Most of these innovations—virtual communities, portals, chat—became popular on the consumer Web and were later adopted by the business. Facilitating real-time communication, coordination, and collaboration among groups of people was the goal of an earlier generation of software called groupware (for example, Lotus Notes). These applications were a major leap forward, for the first time combining tools such as project management, calendaring, chat, whiteboards, and document management. But although groupware was effective in introducing task-based tools to enterprise users, it was limited to new capabilities developed by administrators; end users were not able to create more-customized solutions.

Additionally, like most enterprise software, groupware was not designed to anticipate the rich collaborative, user-centric possibilities brought on by the Internet.

The mid-1990s saw the arrival of portals such as AOL, Excite, and Yahoo. These Web sites provided a front door to the vast amount of information found on the Web. To expand on their role as most users' online starting point, the portals began to offer features such as news, email, weather, stock quotes, and search—in a unified user experience with familiar navigation and layouts. It wasn't long before enterprises began to use the same approach on intranets, providing gateways to enterprise information. Portals not only brought together information locked away in enterprise resource planning (ERP), customer relationship management (CRM), and other legacy silos, but they also used the Internet itself as a platform to allow knowledge workers to collaborate across departmental, company, and even global boundaries. Portals followed groupware as the drivers of worker collaboration and productivity. They significantly expanded the reach and accessibility provided by groupware to incorporate core enterprise resources. However, creating new pages in an enterprise portal or updating content on existing pages was still a top-down, centralized activity—with a common result of stale content and rigid user experiences.

While enterprises were benefiting from groupware and portals, virtual communities were growing in popularity with consumers. Virtual communities—such as Usenet, the Well, AOL chat rooms, and Yahoo! Groups—were part of the Internet from its earliest days. These community experiments established their own cultures, trust systems, and even codes of ethics. They were successful not because of their features (indeed, one could do little other than exchange messages) but because they mirrored offline human interactions. Compared to today's social networks, they look incredibly primitive. They offered minimal user profiles such as a name and email address, no privacy controls, and no way of visualizing relationships with other users. But they were an important step forward in capturing basic online social interactions.

Profile pages on today's social networks go far beyond contact information. Users can customize their profiles to show personal history and share photos, videos, and widgets. These pages update automatically each time a user adds a friend, joins a group, posts a note, or bookmarks an item within or outside the network. They are powerful forms of self-expression and the foundation for social interaction. In addition, social networks include advanced privacy controls that let users determine who can access a profile page and what items they are allowed to see. The concept of a limited profile has proven to be useful; a user might want to share their work history with a prospective employer, but not the pictures from last night's party.

Social networking sites have already become popular for promoting products and services. Though Facebook lacks enterprise-level security and system integration capabilities, its collaborative features are so compelling that some companies are using it for targeting customers, researching potential employees, and yes, even for enterprise collaboration. Much of Facebook's value comes from something not yet seen in enterprise software—the notion of a "social graph." Social networks are defined not so much by their feature sets but by their ability to provide a connective fabric that ties people together. Once connections are made, they can be visualized and information derived from the connections. For example, users can quickly determine how many of their friends of a particular political persuasion also listen to jazz.

So with all this potential, why hasn't there been a plethora of enterprise software offerings for social software? Although Web technologies have advanced to the point where building applications on top of a networked infrastructure is easier, building an online social graph that mirrors employees' real-world interactions is still very hard. And what are the benefits of using a social application within the enterprise? Instead of viewing Facebook as a distraction, the savvy enterprise should learn what makes it so sticky—and how those capabilities could be applied to the enterprise to drive knowledge, worker productivity and accelerate innovation. Enterprise social applications are the next generation of collaboration and productivity tools, capturing the interpersonal knowledge of workers and the implicit connections among people, systems, and data. With them, the invisible becomes visible and actionable in a way never before possible.

Oracle Fusion Middleware: A Complete Enterprise 2.0 Solution

Bridging different data and systems is essential for an agile and intelligent business; however, traditional technologies that bridge these various systems do not go far enough. The impact of Web 2.0 technologies in consumer-facing Web sites, such as blogs, wikis, tags or social networking, has led organizations to realize that these technologies can add significant value to the business. Instead of deploying another "island" or silo of information, what organizations need is Enterprise 2.0 – enterprise-class Web 2.0 technologies that integrate directly into existing applications and systems and also meet their security and availability requirements. To deliver richer connections and become a more agile and intelligent business, organizations will need an enterprise portal platform that contains pre-integrated, standards-based Enterprise 2.0 services. These Enterprise 2.0 services need to be easily accessed, integrated and utilized by users. By giving users the ability to use and integrate Enterprise 2.0 services such as tags, links, wikis, activities, blogs or social networking directly with their portals and applications, they are empowered to make richer connections, optimize their productivity, and ultimately increase the value of their applications.

Complete, Integrated, Hot-Pluggable

Between the data repositories and applications proliferating throughout an enterprise's IT infrastructure lives a nearly invisible layer of software that's of growing interest to many companies. Known as middleware, this layer of specialized software is proving to be of strategic value to businesses seeking to gain a competitive edge. The middleware market is undergoing a seismic change as it moves from individual, standalone products to integrated suites with modular components that businesses can deploy on demand to compete with greater agility. Simply put, middleware helps organizations attain new levels of insight, responsiveness, ease of use and security in the way their IT systems support their business operations. Why? Because in its many varieties, middleware enables disparate applications and data sources to communicate better and helps employees at all levels access and manage the information they need to do their jobs.

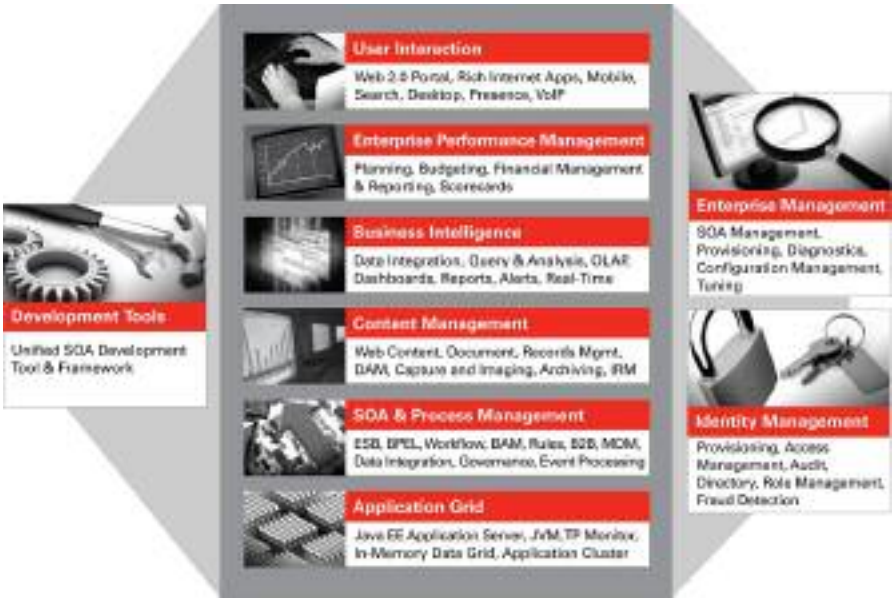
Whether your business focus is on products, services, people or government, middleware application infrastructure is a strategic imperative. This infrastructure is the key to maximizing the processes and applications that drive your business and enable you to innovate at the worker, team, department or organization-level. Oracle Fusion Middleware 11g delivers a foundation for both business and IT innovation. This foundation empowers you to differentiate and succeed throughout dynamic and unpredictable market conditions, while maintaining efficiencies and controlling costs.

Leading private and public sector organizations from around the world benefit from Oracle Fusion Middleware 11g's unique design advantage. This advantage is based on four key principles that extend across all products in the #1 middleware family:

- Complete – Work with a single, strategic partner for all middleware requirements;
- Integrated – Increase confidence and lower costs through certifications and integrations with Oracle Applications, Oracle Database and other Oracle products;
- Hot-Pluggable – Enhance your existing infrastructure and applications with interoperability that goes beyond industry standards;
- Best-of-Breed – Choose from best-of-breed offerings across every product line.

The results: Confidence in your ability to adapt and respond to change. Operational and strategic insight for better, more informed decisions. Agile and intelligent business applications and processes. Secure and rich connections with workers, teams and customers. Accelerated development and reduced IT costs. A foundation for both business and IT-driven efficiency and innovation. Oracle Fusion Middleware 11g offers a comprehensive set of products including tools for application development, integration, identity management, collaboration and business intelligence.

Figure 2: Oracle Fusion Middleware Technologies.



Enterprise Portals, User Interaction and Team Collaboration

Oracle's Fusion Middleware Enterprise 2.0 Portal and User Interaction solutions create rich connections among your people, processes, information and applications for greater productivity and cost savings. Oracle offers a comprehensive strategy based on choice, innovation and information excellence, whether you're consolidating portals, embracing social networking technologies for improved productivity or "going green" with paper-based processes. Oracle WebCenter Suite 11g is a complete, open enterprise portal platform for creating enterprise portals, social and composite applications, and Internet and extranet Web sites. It creates a foundation for innovation within organizations, helps make resources more useful, and increases worker productivity.

Enterprise Management
Oracle Enterprise Manager is a complete application management solution that allows you to manage your applications top-down from a business perspective. This allows you to identify business exceptions rapidly, pinpoint root cause issues using drilldowns in the underlying technologies and infrastructure, and remediate the issues automatically before they become emergencies. A key component of Oracle Enterprise Manager is the Configuration Management Pack, which provides discovery, asset tracking, analytics, change detection and compliance assessments and reporting. Included with the Configuration Management Pack is the Configuration Change Console that provides breakthrough capabilities to automate real-time IT configuration change management through comprehensive, continuous detection, validation and reporting of authorized and unauthorized configuration change. Oracle Enterprise Manager allows organizations to rapidly respond to changes and have a clear view of the infrastructure at all times.

Pervasive Business Intelligence and Strategic Decision-Support
Oracle Business Intelligence Enterprise Edition Plus and Data Integration capabilities enhance the quality and accuracy of business analysis across data sources and speed the delivery of information to those who need it. Pre-built business intelligence applications and Enterprise Performance Management capabilities help enhance the quality and timeliness of strategic business decisions—from the executive suite to individual lines of business such as manufacturing, sales and human resources. BI helps organizations interpret change and options by harvesting information from external sources via the Web and mixing that with the signals that its people are picking up. This then helps organizations to operationally execute quickly and effectively on the flow of business and market intelligence.

Enterprise Content Management
Oracle Content Management manages the entire spectrum of unstructured content—from documents, graphics, and Web pages to scanned images, e-mail, and records. With one repository for all content, it's easy to share content with customers, partners, and suppliers across the enterprise. Oracle Content Management converts nearly 400 file formats to Web-ready formats such as HTML, XML, GIF and PDF, and delivers secure content via Web sites, desktops, RSS feeds and mobile devises. Version control and search ensure you have the most up to date information and enable you to easily find, access and reuse content. Oracle Content Management helps to minimize risk by allowing organizations to control access to content, maintain audit trails, and automate the retention and disposition of content based on consistent policies.

Business Process Management and Service-Oriented Architecture
Oracle Fusion Middleware Business Process Management, Data Integration and SOA capabilities provide a unified process platform for composing and managing adaptable and repeatable processes and scaling out services. Process modeling, simulation and standards-based execution accelerate the speed and accuracy of development, while Data Integration and SOA Governance provide information and service-level agreement clarity. Oracle SOA Suite 11g delivers a complete, integrated, best-of-breed technology foundation for building next generation business applications and helps to operate costs effectively.

Application-Centric Identity Management
Significantly reducing the overhead costs of security and administration and protecting sensitive business information, Oracle Fusion Middleware Identity Management solutions automate user provisioning and de-provisioning and provide single sign-on capabilities for information security and user productivity. A unique, application-centric approach delivers vast improvements in the speed of

compliance and e-discovery exercises, worker productivity and reduced business risk. Oracle Identity Management 11g is a fully integrated suite that provides the foundation for Oracle's Service Oriented Security strategy.

Application Grid for a Business that Outperforms
Oracle's approach to application grid optimizes resources so applications get what they need, when they need it, and at a lower operational cost. Oracle WebLogic Suite 11g, the foundation of application grid, takes advantage of modern hardware and software architectures and delivers the highest performance, reliability, and agility at any scale. At the same time, Transaction Processing Monitors provide mainframe-class scale and performance for legacy systems in an open, distributed environment. This helps to align IT and the business, reduce operational costs and increase performance.

As Enterprise Applications and Business Processes are deployed on an Internet Architecture, organizations continue to demand a unified and standards-based Middleware Infrastructure on which to develop and deploy these Applications. Oracle Fusion Middleware 11g further extends Oracle's vision of delivering a complete, integrated, hot pluggable and best of breed Middleware Suite.

Agile and Adaptive Enterprise Applications

Changing markets, competitive pressures and evolving customer needs are placing increasing pressure on IT to deliver greater flexibility and speed. Leading companies are adopting Service Oriented Architecture (SOA) as a means of delivering on these requirements by overcoming the complexity of their application and IT environments. SOA helps businesses achieve operational excellence through process efficiencies and cost rationalization while driving timely innovation in response to economic and market shifts. With Oracle SOA Suite 11g, businesses can attain improved efficiency in terms of utilization of IT assets and human capital through business process automation, and increase agility through agile, adaptable, and rules-driven business processes.

In the last 3 to 5 years there has been widespread adoption of SOA, with businesses making significant economic investments in service-enabling their IT systems. As the SOA benefits become apparent and materialize through process automation, application integration, and legacy modernization, businesses are now seeking to make their enterprises even more efficient and agile by being able to rapidly compose and revise business applications while capitalizing on these SOA investments. Oracle SOA Suite 11g is a significant step forward in empowering enterprises cross the chasm to the next generation business applications that is powered by a platform delivering rapid composition, comprehensive lifecycle management, easy customizability, and easy upgrade manageability and monitoring.

Cost-Effective IT Infrastructure
In contrast to conventional integration technologies and approaches, integration projects implemented as SOA orchestrations, using Business Process Execution Language (BPEL), have yielded significantly shorter change cycles. The SOA services layer has often proven useful in decoupling a unified process from multiple back-end systems and providing an illusion of a single process across multiple siloed business units. Additionally, this services layer has been used to insulate or future-proof front-end processes and systems from back-end infrastructures by serving as a stop-gap until the back-end systems are re-architected. With SOA based Enterprise Application Integration (EAI), businesses are able to reduce maintenance cycles from months to weeks, and reduce up to 70% of their IT expenditure on software maintenance.

On one hand, SOA allows IT organizations to break free from the shackles of traditional, proprietary, integration broker technologies by advocating a common, interoperable and open standards-based approach to integration. On the other hand, SOA based integration has relied on a broad array of technologies such as BPEL engines for process orchestration and ESBs for service mediation that have disparate products with independent development environments. This has left enterprises with the challenge of mastering multiple products in their already heterogeneous IT environments. Besides, the modular nature of services and processes in the world of SOA has resulted into service and process proliferation, which in turn creates a higher level of redundancy. Oracle SOA Suite 11g overcomes this paradox by offering a unified process platform for human-centric, document-centric and system-centric workflows. Its unified composite application designer, which is based on the Service Component Architecture (SCA) standard, provides rich, graphical drag-and-drop capability enhancing developer productivity; the comprehensive governance tools that promote service discovery and reuse reduce redundancy.

Operational and Business Visibility

Even though SOA has gained widespread acceptance, transitioning to SOA requires prudent and careful planning. If SOA artifacts are left unchecked, over a period of time, the inventory of the SOA artifacts can become unmanageable. The result is a diminished reuse of services and brittle business processes, thereby negating the value of embracing SOA in the first place. Effective SOA governance provides you with visibility into, and oversight of, the relationships and interdependencies that connect services to other elements of SOA across the organization. Oracle SOA 11g offers a comprehensive end-to-end governance platform that provides visibility and encompasses people, processes, and technology to effectively manage and optimize your organization's investment in SOA and ultimately achieve the expected business value from your SOA investment.

Significant improvements in operational decision-making can be attained by capturing and processing, in real-time, business events generated by probes and sensors deployed in everything from IT networks to enterprise software systems and physical world devices (through RFID readers, bar cod scanners, manufacturing equipment sensors and others). A specialized class of event-processing solutions has emerged that when coupled with SOA, streamlines and automates business processes by synthesizing information across silos for proactive, real-time, decision-making aligned to organization key performance indicators (KPIs). Oracle SOA Suite 11g brings event-driven SOA to the mainstream, empowering businesses to process multiple event streams to detect patterns and trends in real-time and utilize business activity monitoring to capitalize on emerging opportunities or mitigate developing risks.

Innovation for Flexibility and Efficiency

Change is expensive; both in terms of pure cost, diversion of scarce resources, risk and lost opportunity for the business until it is achieved. By combining business process management (BPM) and a service-oriented approach to IT management, business integration can promote efficiency and automation across all processes, ensuring that existing IT assets support actual business processes and new IT investment is focused on maximum return. Although simple in concept, business integration has conventionally been difficult to implement. Oracle SOA Suite 11g improves the parity between business and IT through a common metadata model to map and synchronize conceptual processes and requirements formulated by the business side of an organization with their actual implementation models developed by IT.

Additionally, with the rise of the Internet, many companies are now offering their services through multiple channels such as company agents, online services, and links to partners. Each channel offers a slightly different capability and process, but they are all based on the same core services. Although a SOA services platform is well suited to power such multiple channels, configuration-driven process automation has been long envisioned as the holy grail of dynamic business processes. The business rules engine in SOA Suite 11g provides centralized rule definition and management, thereby improving the ability to respond to change and achieve faster, multi-channel, time-to-market.

Oracle Fusion Middleware is enabling leading companies to gain operational efficiencies and business agility through adaptable, re-usable business processes and services built on a truly flexible SOA foundation. Oracle SOA Suite 11g enables agile and intelligent enterprises by facilitating business critical IT initiatives geared towards improving efficiency, flexibility, visibility and cost-effectiveness.

In addition to SOA, Oracle WebCenter Suite is enabling organizations to create a more agile and intelligent business. Business users traditionally depend heavily on their IT organization for application or portal customizations and that can be a bottleneck, both in terms of resources as well as interpretation, and a severe barrier to the need for increasingly frequent change. What organizations need is a proper set of customization and personalization capabilities that are simple enough for the business user to use, yet powerful enough to create the enhancements they require.

User-driven Customization and Personalization
Business users can customize or personalize any page using the on-the-fly visual page editing features in WebCenter Composer, a component of WebCenter Sutie, Users access and select different resource components available in WebCenter's Business Dictionary in order to add new content to the page. The Business Dictionary provides a role-based view of available components or resources, and these components can include information from a variety of enterprise resources such as enterprise applications, managed content, rich media, business processes, or business intelligence systems. Together, WebCenter's Composer and Business Dictionary give users access to a powerful, yet easy to use, set of tools to personalize and extend their WebCenter portals and applications without involving IT.

User Customizations Persist Throughout the Portal Lifecycle
Customizations change everyone's view of an application or portal and are typically required to "brand" a delivered application or portal for a specific customer or purpose. Customizations include simple changes such as inserting a logo or altering the colors to match those of your organization. They can also involve adding items to a page, changing the layout of a page, altering a supplied process, and specifically tailoring the delivered application or portal to meet any business need. WebCenter Composer provides a flexible model for effectively storing these customizations through Oracle's Metadata Services (MDS). Traditionally, these customizations are stored as part of the application, and are lost when a patch or upgrade to the base application is deployed. With Oracle WebCenter Suite 11g and Oracle MDS, all base application definitions, customizations, and personalizations are stored in the Oracle MDS repository as a layer on top of the base application. The benefit to business users is their customizations and personalizations are maintained throughout the lifecycle of the application. Additionally, business users performance improves, resulting in more sales, better customer service and increases in productivity. With Oracle WebCenter Suite 11g, IT can develop and deploy new versions of applications

without losing customizations or personalizations that were added over the life of the product by business users. This results in better IT responsiveness and a more agile and intelligent business.

User Create "My Page" Views with Personalizations
Personalizations made with WebCenter's Composer and Business Dictionary change a user's view—and only their view—of a portal or application page. Other users are not affected by the changes a user makes to a page. Many Web sites and social services on the Internet today provide a means for users to create their own "personal" page. Users can decide what is important to them and organize information so that it is quick and easy to find. WebCenter Composer enables personalizations by displaying information from WebCenter's Business Dictionary in a role-based view, so that users see only resource components relevant to them. For example, to personalize a page, a sales representative might select a list of current customers, a list of current leads or sales opportunities, and a list of past customers and products up for renewal. A customer support representative might see only a subset of these components in his or her view of the Resource Catalog. The important point is that individuals can tailor the page to add any combination of components to their pages whenever they want or need them, without affecting everyone else's view of the page.

WebCenter Composer is also leveraged extensively inside Oracle WebCenter Spaces, a ready-to-use application that delivers dynamic business communities, to enable users to customize and personalize Personal and Group Spaces. The Oracle WebCenter Spaces application provides a working example of how end users can take an active role in managing and altering their work environment to match their specific needs and requirements, creating a more agile and intelligent business.

Efficient Hardware, Software & People

Most enterprise IT shops have amassed a diverse set of software applications. In many cases, the overall infrastructure is made up of isolated islands of software tied to dedicated hardware assets and connected by point-to-point integration technology. The isolated nature of these information systems makes them extremely inefficient, with server utilization rates of less than 10 percent. There is no easy way to share unused capacity, yet it's hard to tell when an application is approaching its performance limit. Worse still, because reliability is managed on a per-stack basis, it's difficult to predict when a system will go down and nearly impossible to dynamically address problems. These isolated technology stacks are also expensive to scale since it usually means adding new stacks at a large cost per increment. This wasteful, disparate infrastructure works at odds with the needs of the business. Adopting the right foundational middleware can help.

Responsible companies are learning how to run their data centers more efficiently using less hardware, less software and less IT resources. Some of these companies are turning to a new concept called application grid, an infrastructure layer beneath the application layer that pools and dynamically provisions the resources on which those applications run.

Extending the Grid
Grid computing is a technology architecture that virtualizes or "pools" IT resources —such as compute power, storage and network capacity—into a set of shared services that can be distributed and re-distributed as needed. This architecture enables groups of independent, modular components to be provisioned on demand to meet changing business needs. Oracle has been a leader in grid computing technologies, most notably with Oracle Real Application Clusters (RAC).

Application grid brings the same type of efficiency, scalability, and quality of service to the application layer that database clusters brings to the database layer.

It enables system administrators to pool and allocate the runtime infrastructure that supports enterprise applications, such as Java application servers and transaction processing systems. The goal is to enable application server instances to work together to make better use of physical resources. In contrast to the traditional monolithic architecture, this new approach enables multiple application servers to pool and share the underlying compute resources, dynamically reallocating these resources across the applications being served as needs evolve. Application grid enables application servers to work together to provide a shared, dynamically allocated pool of resources for a given set of applications.

Using the application grid approach—the grid for the middleware layer—astute customers are solving many of the classic, but difficult to solve IT problems the industry has been wrestling with for years, such as:

- The need to do more with less (as opposed to the business, which wants to do 'less of more' in terms of introducing flexibility into its products, and services) – to bring greater efficiency to data center operations and resources;
- The need for greater flexibility in how applications are scaled and provisioned;
- The need for reliability and predictability to determine when an application is nearing its performance limit and the ability to do it consistently;
- How to reconcile the tremendous diversity of technologies within the data center and the siloed structure of most applications.

Application grid leverages new and existing technologies to make the middleware infrastructure more efficient and better aligned with application needs. By pooling, sharing, and dynamically adjusting the resource supply to meet fluctuating demand, the application grid enables IT departments to do more with less. For example, enterprise applications typically have variable demands and it is unusual for all of them to hit their peak operating loads simultaneously. Application grid helps IT professionals to allocate a pool of middleware capacity that makes it easier to maintain desired service levels for a group of applications while reducing the physical resources needed to support those applications. Application grid functions like an IT utility. Commodity servers constitute the grid infrastructure. Decoupling and pooling resources enables IT managers to grow the overall resources pool in small relative increments, which allows incremental scaleout on commodity hardware.

Figure 3: Application grid as the new architecture for enterprise application infrastructure.

Business Drivers for Application Grid
Business needs are continually evolving, forcing IT managers to respond to continual requests for application changes, adapt to fluctuating workloads, and create an IT infrastructure that can meet critical business requirements. Application grid fulfills these requirements with extremely flexible runtime capabilities that make the IT department more responsive. Let's look at some of the business and technical drivers that are motivating today's companies to adopt principles of application grid.

SOA and Event Processing
There have been many discussions on the value of and ways to implement SOA. It could be a pure technology integration or a complete adoption or extension. With the introduction of Enterprise 2.0, we see that it consists of a blend of new technology built as collections of 'services' which require an architecture for their 'orchestration' or SOA. Applied well, SOA is the essential 'glue' to ensure that the fine-grained services can be connected and reused in a flexible way. But underneath each SOA service is a monolithic stack -- an application server with a static allocation of CPU cycles, memory, and storage capacity. Since each stack is statically configured, it has to be set up for the greatest possible load. As a result, most of the time, the stack is underutilized.

Despite its many benefits, SOA possess its own set of challenges to the underlying middleware infrastructure. Developing an architecture that guarantees performance, throughput, availability and reliability isn't easy. SOA environments include composite entities made up of components or services, with the most popular services experiencing the greatest demand. As services and applications proliferate, do IT professionals have a good way to monitor these services?

That's where application grid technology comes in. For example, even if a database server is down, a shared database cache can ensure data remains available so IT can uphold important SLAs. Such an "in-memory data grid" can adapt to and accommodate faults in underlying hardware, allowing the application to continue seamlessly with no data loss. This helps IT managers fulfill the promise of SOA: to achieve greater performance, reliability and flexibility. Similarly, event processing technology helps monitor and analyze trends and patterns in real-time, empowering enterprises to respond rapidly via automated or manual alternatives.

IT Modernization
Many established organizations are moving business content out of legacy applications and into more cost-effective and versatile IT environments—a process called IT modernization. The goal with these projects is to retain existing application assets by transforming them to modern languages, databases, and services. While companies are challenged to embrace Internet computing models and service-oriented software architecture, they also can't afford to throw away these entrenched business systems.

As organizations migrate IT operations from mainframe systems to commodity servers, they often need extreme transaction processing performance. Application grid answers their needs. For example, open systems-based transaction processing monitors are available to re-host mainframe applications on mainstream hardware. In the context of application grid, these transaction processing monitors provide cost-effective reliability, extreme scalability, and investment preservation by extending the life of existing IT assets as part of modern architectures such as SOA.

Green Initiatives
CIOs, system administrators, IT architects, and operations personnel are all challenged to run more efficient data centers by reducing energy usage and minimizing the impact of IT operations on the environment. As the IT industry builds larger data centers and companies adopt grid-based business models, running efficient data centers is becoming increasingly more important.

Adopting environmentally friendly IT policies not only benefits the environment; it improves the bottom line. For example, most servers are used at about 10 percent of capacity on a daily basis, and the typical scenario is to allocate a distinct server for each application.

Application grid technology has a huge impact on efficiency by using servers more judiciously. For example, by running multiple applications on the same server, average capacity can be increased to 50 percent or higher, with no loss in throughput or reliability. This results in fewer servers used, with the consequential benefits of less floor space, power, and cooling needed.

The Evolution to Application Grid
Oracle has devised an evolutionary path to help customers make a gradual move to application grid. It is not an all-or-none, rip-and-replace proposition. Most Oracle Fusion Middleware customers already have elements of a grid-like infrastructure and thus can adopt application grid practices in stages. Astute customers move forward by identifying parts of the infrastructure where application grid will yield immediate benefits. They build from there to gradually consolidate and migrate the entire middleware infrastructure on to this comprehensive foundation.

Many organizations have already gone part of the way down the path to application grid by using the clustering mechanisms in contemporary application servers for horizontal scale-out and using scripting to partially automate the addition and removal of cluster nodes. The may also use distributed caching technologies for extreme scalability. Real-time JVM technology provides the predictability and instrumentation for applications with microsecond latency demands, while management technologies with increasingly sophisticated mechanisms for cross-grid optimization continue to evolve.

Oracle has combined mature products from the Oracle Fusion Middleware family to help companies achieve scalable application server workloads, extreme transactions, guaranteed SLA compliance, and dynamic management of the application software and infrastructure software, all on low cost commodity hardware.

Create a More Efficient Organization
Software and hardware aren't the only parts of the business that need to be efficient. There needs to be user-friendly services and capabilities that allow business users to easily create a single-view of all the resources available, and quickly share these findings, resources and information with other users and groups within, across, and even outside their organization.

Manage Information and Create Dynamic Business Communities
Included in Oracle WebCenter Suite 11g is WebCenter Spaces, a ready-to-use application that delivers dynamic business communities with all the rich WebCenter Services to empower teams to quickly and efficiently manage their information, applications, projects, and people without requiring IT assistance. It brings together the latest technology around Enterprise 2.0 and social computing, communities, personal productivity, and ad-hoc team interactions without any development effort. Oracle WebCenter Spaces allows users to work more

effectively with project teams and work groups, including teams that span multiple geographies, and even include external members. It eliminates or reduces duplication of efforts and content inconsistencies, and it enables the sharing and collaboration on team content, focusing an organization's valuable resources on solving business problems, tapping into new ideas, and reducing time-to-market.

By providing a dynamic foundation for users to work together in teams and aggregate relevant information, WebCenter Spaces helps your enterprise address many challenges, such as:

- Inefficient communication across geographically dispersed teams
- Error prone manual business processes slow the progress and completion of projects
- Relevant information is locked away on individual desktops and inaccessible by others
- Overusing email for collective content authoring, resulting in version control issues
- Distributing business intelligence and analytics in a time-sensitive manner
- Accessing Enterprise Applications in-context of business processes

WebCenter Spaces includes Personal Spaces, Business Role Pages, Group Spaces and Group Space Templates, enabling business users to create and manage productive online business communities integrated with their enterprise and departmental portals.

Figure 4: WebCenter Spaces.

User-Created, Customized and Managed Individual Work Environments
Personal Spaces provide individual users with a dashboard of all the information they believe relevant to them. Users' personal spaces likely include links or portlets for critical applications they use every day, they can add their own personal feeds from a friend or colleague's social network pages, and it's an easy way to quickly access their personal email, tasks, recent documents, and the tags they use most. Personal Spaces deliver a way for each user to have their own set of personal pages that they can create, change, and even share with others. It's an ideal way to streamline a knowledge worker's access to a wide variety of information sources, applications, business processes and data so they can be more productive. Personal Spaces also provide a great way for users to quickly create connections between others within the organization, thus saving time and increasing resources.

Deliver Role-Specific Applications, Content and Communications
The Business Role Pages provide a powerful way to communicate with specific types of users within departments or functional areas and even across the company. As defined in an enterprise, users have specific roles for their various groups from administrators to sales representatives, engineers to business managers. Communicating with a specific set of people in these roles can be challenging. Business role pages provide an efficient way to attach a page or set of pages to a specific enterprise role so that all the users are kept up-to-date with information specific to them and their job function. By utilizing Business Role Pages, users can reduce the time in takes in finding experts and create a more efficient organization.

Create Dynamic Online Communities
Group Spaces provide a meaningful way to manage all project details involving any group of users. Group spaces also make it easy to deliver a departmental or enterprise portal without making the business wait on IT. Additionally, Group Spaces can be completely customized by business users. They can make simple customizations to navigation, color scheme, or the look and feel of portlets. Business users also have access to a role-based view of various pre-integrated enterprise resources, so they can easily add relevant applications, content, business intelligence, or business processes directly to their group space to make it more useful. With these new dynamic business communities and the large number of pre-integrated Enterprise 2.0 and social computing services, teams can start working immediately and enterprise portals can be delivered in an extremely short time. Finally, what sets WebCenter Spaces apart from all other offerings is that these dynamic business communities can be completely embedded into a business process or a modern business application. This enables organizations to capture these unstructured activities as part of the business process or application, providing a complete and integrated view across the business.

Capgemini: Delivering Real Solutions in an Enterprise 2.0 World

Enterprise 2.0 seems to be a confusing topic meaning different things to different people, and yet seems to contain compelling elements that make it difficult for any manager to feel comfortable about ignoring it. This paper aims to bring an understanding on a broad level of the 'big picture' of Enterprise 2.0, and its simultaneous impact on both the business side and the technology side -- an impact that requires a cohesive approach to bringing about success. Capgemini has worked with Oracle and its ecosystem of partners to achieve this.

Many Business managers prefer to approach change through small, quick, well targeted projects and drive improvements in front office, market-facing activities. CxO level executives often times develop their strategy for a comprehensive business model transformation in the face of acute market conditions or introduce a new wining position. For IT managers, the issue of cost will never be far away, and the need to improve business intelligence, collaborative working, ediscovery, business activity monitoring and process improvement are all high on the list of issues to be addressed. Against such a diverse range, Capgemini offers a comprehensive portfolio of project and outsourcing services and specialized approaches targeting the Enterprise 2.0 business practices and technologies to help organizations achieve success.

- Capgemini TechnoVision: The first stage for executives and managers, both from business and IT, to grasp the impact of seven critical clusters of technologies on their business and markets, in order to access their priorities and build a vision of how technology can be used by their business and competitors to change markets, products and working practices.
- Capgemini Rapid Innovation, or RAIN, Implementation: A highly focused activity to translate an outline requirement into a fully developed and detailed specification for delivery using visual demonstrations of the ways that new technologies and products could be used to address the requirements. RAIN enables executives and managers to understand their options and develop their optimal solution.
- Capgemini Rapid Design and Visualization, or RDV, Iterative Delivery: By using the latest agile implementation techniques coupled with visual prototyping, and experienced staff to design the critical user interface, RDV provides extremely rapid delivery of new requirements and support continuous on going iterations as experience in the new business functions and capabilities builds.
- Capgemini Oracle Fusion Experience, or COFE: A collaborative venture between Oracle and Capgemini to support a testing and demonstration laboratory to support the wide range of capabilities delivered by Oracle Fusion Middleware that creates the integration between the business functions and products vital to leveraging the Business capabilities of the enterprise from the complete stack of Oracle products.

Conclusion

The ability of businesses to be agile and responsive to change is more important than ever before. Information and the interactions around it have become the key assets of most enterprises, and making correct decisions in shrinking cycle times is the defining operating characteristic of winning companies. The market imperative to access the right information and people at the right time has led to an increased interest in building a next-generation enterprise workplace. Leveraging Web 2.0 technologies and usage patterns helps to transition the enterprise to an Internet-powered, user-focused, and community-centric social fabric that ties together people, ideas, content, processes, systems, and enterprise applications.

Bringing Web 2.0 capabilities and services to the enterprise is about more than just the latest technology; it's about changing the traditional business model and tapping into the creativity, intellect, and passion of every single employee. It is much more important for companies to understand the changing trends in business than to just implement the next "hot" technology product. Companies need to foster the development of new ideas, tap into critical employee thinking and knowledge, and enable the synergy of teams to revolutionize their existing business models and achieve lasting success.

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About Capgemini and the Collaborative Business Experience

Capgemini, one of the world's foremost providers of consulting, technology and outsourcing services, enables its clients to transform and perform through technologies. Capgemini provides its clients with insights and capabilities that boost their freedom to achieve superior results through a unique way of working, the Collaborative Business Experience™. The Group relies on its global delivery model called Rightshore®, which aims to get the right balance of the best talent from multiple locations, working as one team to create and deliver the optimum solution for clients. Present in more than 30 countries, Capgemini reported 2009 global revenues of EUR 8.4 billion and employs 90,000 people worldwide.

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