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The Delphi Report

Insight for Business and Technology Leaders

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Editor's Note

Opportunities Multiply

I've always been fascinated by Adam Smith's invisible hand – the way markets and economies are driven by invisible forces that seem to defy the prognostications of even the smartest among us. As a leader, however, you must build organizations that can withstand and thrive in the future, even if you cannot predict it. In today's climate of high uncertainty and global unrest this difficult task of the manager and leader seems next to impossible. Or is it?

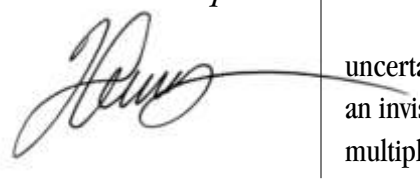
I recall economist Paul Romer once saying that the difficulty we all have in predicting the future is that "opportunities do not add up, they multiply."

In this issue of the Delphi Report we will look at many of the factors that are involved in that multiplication effect. These are opportunities to apply sound business methods, concepts, frameworks and technologies to the complex problems we face in our organizations and our world.

From the reshaping of commerce through the use of Business-service Platforms to the evolution of process management tools to the emergence of social networks, there is a common momentum building in how we leverage this new era of global connections in ways that we are barely beginning to perceive.

These are complex times for business leaders. Risk and uncertainty have taken center stage. But somewhere, perhaps tallied by an invisible hand, but certainly in these pages, opportunities are already multiplying.

Thomas M. Koulopoulos



By James Champy and Thomas Koulopoulos

The Invisible Hand of Commerce

How business-service platforms may revolutionize how we buy, sell, and trade.

EXECUTIVE SUMMARY:

The new business-service platforms will fulfill B2B's promise to revolutionize the way we trade. These hubs differ from dot-com era E-marketplaces in leadership clout and integrated processes. What will drive businesses to participate are mandates from powerful companies, full services, and a clear perception of integrity, trust, and accountability.

A new platform for commerce is taking shape. A concept called business-service platforms is emerging to denote hubs of enormous networked communities. Driven by some of the largest global companies, BSPs hold the potential to revolutionize the way we trade, alter the role of software providers, and transform the very nature of trust among business partners.

We believe that companies such as Dell and Wal-Mart are building commerce hubs that will emerge as BSPs – electronically enabled networks of traders that include both suppliers and customers. Within these networks, suites of business processes will begin to standardize how commerce works within an industry.

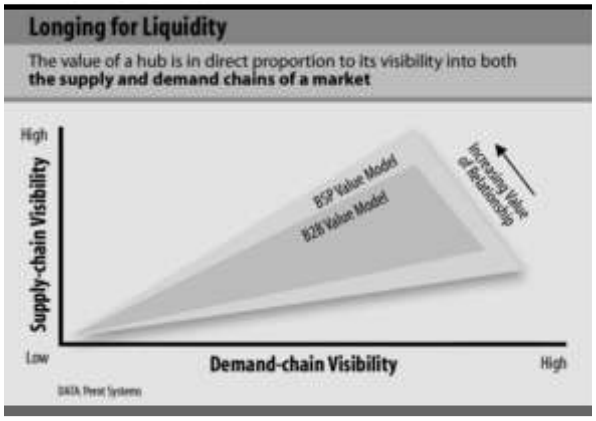
These company-driven BSPs will be the first generation of hubs, followed by a second generation that will be more open – that is, they'll be places where multiple, competing product and service providers do business. Imagine, for instance, a BSP that both Wal-Mart and Target might use. That wave of BSPs will be managed by third-party facilitators – possibly IT service or software providers – supported by one or more major vertical-industry players. The facilitator will have deep business-process skills in the vertical segment. We call these facilitators "process aggregators."

But stop right there if you think hubs of commerce are radical and new. It wasn't so long ago that a similar concept swept through E-commerce circles. It was called B2B, and it was the last vestige of prosperity and vision before the dot-com slide. Despite some busts, there were many great ideas, and the lessons of B2B have much to teach us about the way commerce works and the fundamental behaviors we need to adopt before the new generation of hubs will start to pay off on the promises made years ago.

A Fish Story

Let's take the example of Neal Workman. In November 2000, his B2B marketplace, Gofish.com, was on a roll. Workman had raised $42 million in venture funding and the site was poised to be the online exchange for buying and selling fish around the world. No overnight success, Workman was a sharp guy who had grown up in the fish business; Gofish.com was his moment in the sun.

Workman, of course, wasn't alone. Dozens of online exchanges had sprung up on every electronic street corner, from energy exchange AltraEnergy.com, to metal exchange e-Steel.com, to janitorial-supplies portal janCentral.com. And, like these, most failed.



If you listen to Workman tell his story, the failure was due to the reluctance of buyers and sellers to move to an entirely online mode of commerce; they wanted only to dabble in online commerce. But that belies a much deeper set of issues that undermined the Internet-based B2B commerce hubs that were once thought to be the cornerstones of a new economy.

These exchanges promised to deliver new levels of liquidity for markets by reconfiguring supply chains to meet changing market requirements. Like economist Adam Smith's invisible hand, online markets would swoop in to shape commerce. The idea was elegant and simple. An online hub had unique visibility into both the supply side and demand sides. This would enable the hub to identify opportunities for products and services, and then orchestrate and recombine components of the supply chain on demand to deliver these new products. In other words, the hubs would become market makers, taking positions in each market – and in transaction fees to boot.

But things never materialized quite that way. Something important was missing from the B2B recipe that technology alone couldn't make up for. Although the message at the time was that B2B exchanges would become vast communities of commerce in every industry, they never succeeded as business platforms. It was as though the market was trying to make bread rise without the yeast.

While most online exchanges were shuttered with the implosion of the dot-com market, others, such as Ariba, Commerx, Covisint, GlobalXChange, and Verticalnet, survived by morphing into supply-chain service specialists, purchasing portals, or basic online auctions. Today, these players are rebuilding their businesses, and though not the hubs of commerce they'd set out to become, they're successful in their respective technology niches.

What happened to the promise of B2B hubs is a lesson everyone in IT needs to learn before taking the idea of commerce hubs to the bank. After the hoopla subsided, the true hubs of commerce that emerged weren't the third-party facilitators or online marketplaces, but the market gorillas themselves. The rise to power of the Dells, Home Depots, and Wal-Marts is perhaps the most valuable lesson in how commerce works – online or offline.

While Workman's assessment of the market's reluctance to move to new ways of doing business is accurate, it doesn't explain how to move markets.

Commerce is fundamentally about complex processes and relationships, and both are built over long periods with substantial investment. While the promise of liquidity and growth may have conceptual appeal, it's ultimately cost that prevents change.

The barriers to entry for any new technology are often steep. If these aren't removed by a moment of severe crisis and a pronounced external mandate for change, technology alone won't succeed in causing any substantive change in the way markets behave.

In addition, there was a clear and present danger for any business moving to a hub model if that hub didn't end up as *the* hub for its vertical. The

catch here was obvious: No trader or buyer wanted to place a big enough bet until the winner had emerged. In this winner-take-all scenario, competition was fierce. The prize went to those who could build the community fastest. In this way, the initial stages of the B2B roll-out more resembled a 19th-century homestead land grab than a 21st-century sale of E-commerce technology – each contender seeking to out-partner the other.

No buyer wanted to place a big enough bet until the winner had emerged

One of the first test cases of this business model was e-Steel, a neutral site founded by steel executives in 1999. E-Steel went live as a community portal courting the top players in the steel industry, such as Cargill Steel, U.S. Steel, USX, and Worthington Industries. The benefit of successfully organizing this type of partnership was instant liquidity for members. In e-Steel's case, within hours of switching on its trading capabilities, two of its leading producers had already executed a transaction across the system.

Failure to win the support of the top producers prevents the viability of any exchange platform. E-Steel charged only the seller a fixed transaction fee of 0.875%, with no charge to the buyer. It didn't take long for e-Steel to realize it needed to offer the value-added capability of supply-chain optimization and access to allied services, such as collaborative development and logistics management. Without this, transaction fees would erode, making the business model untenable.

All of this activity didn't go unnoticed by the software industry, notably ERP players, such as Oracle and SAP, which rolled out their own equivalent market hubs. The test was whether community support or existing market penetration of internal infrastructure would prove the more dominant force. Surprisingly for most, neither the online marketplaces nor the software vendors walked away with the original prize.

Instead, the victors were companies that had come to be known as the "brick and mortars" – those lumbering giants that feared the dotcoms would wipe them out. Their strength wasn't only their established communities, but their ability to move their communities beyond dabbling online – by creating economies and mandates to force the shift to online hubs. This wasn't a technology issue; it was an issue of market leadership and trust. The promise that online markets made about liquidity and growth were well-founded, but merely shadows on the wall compared to the power and credibility that a Ford or a General Electric can wield with suppliers.

Today's CIOs need to heed this call to leadership and integrity. If Black & Decker, The Gillette Co., Newell Rubbermaid, Procter & Gamble, and myriad other large brands are going to bet double-digit percentages of their businesses on these new hubs, there will have to be more to bet on than the promise of technology. A complete range of services, a clear perception of integrity, and a level of trust and accountability will need to form around these new hubs of commerce – and we think it will. For CIOs, the call to these mandates and the responsibility to look beyond technology is clear if the new hubs are to genuinely reshape the way we do business.

Evolution of a BSP

How will BSPs evolve? Primarily, they'll occupy leadership roles in industries that let them take large-scale risks and then distribute these risks across large populations. They will also circumvent the risk of having to pick and choose the technology winners, because part of the BSP's role is to establish the technology platform. As with EDI over the Internet (EDI-INT), which mandated the use of specific technologies in order to establish a secure 24/7 trading network for Wal-Mart's suppliers, the risk is taken off the partner and put onto the hub.

A good example is radio-frequency identification (RFID), which, when pushed through the BSP mega-hubs such as Wal-Mart and Gillette, can create massive markets for RFID-technology providers. They'll cause equally dramatic cost reductions.

There's a downside to the BSP model, too. The outcome of these efforts is often a highly verticalized and proprietary software environment, with specific community-oriented domain knowledge, collaborative capabilities, and embedded business processes. This can easily lock partners into a hub, make transfer costs high, and in many cases require participation in multiple BSPs. But the price is one most BSP hub members are willing to accept.

The BSP model may be as significant a step forward for the evolution of technology as operating systems once were for computing. It may be a radical thought for many who have developed an IT supplier's view of the world, but the BSP is quickly becoming the driving force in determining the software and technologies that companies need.

And herein lies the most elusive problem for software vendors to address: process management. The efficiency of commerce, its speed, and ultimately its liquidity are based mostly on how well the complexity of tasks and activities are orchestrated. All businesses have access to the same fundamental technology components; it's the way in which they use these technologies to coordinate activities across myriad inter- and intraorganizational boundaries that determines how well they execute. Simply put, process capability is 99% of competitive success in any industry. Rather than merely hosting horizontal applications for individual companies, BSPs provide the process platform for an entire vertical community.

Why is this so radical? It represents a previously unknown level of process integration. Think of the simplicity and process transparency of an online service such as ADP's payroll outsourcing, and then apply this notion to all the touch points across your value chain. That's the promise of BSPs. Instead of just presenting an Internet hub offering specific applications and technologies, with no explicit continuity among process participants, this new breed of BSP exists as the business process itself. It's provider, producer, and conductor of the fundamental process activities. This is something that software vendors have been trying to pull off.

BSPs offer another benefit: that of letting companies share centralized information from process to process. BSPs will assume the role of process aggregators, leveraging the information to provide additional value-added services. It's not farfetched to imagine a BSP with deep visibility into supply-chain capabilities identifying entirely new ways to reconfigure partners' competencies and resources to

UPS Offers High-Visibility Solutions

How does United Parcel Service of America – a $33.5 billion logistics hub of commerce that already owns a fleet of airplanes, moves 13.6 million packages daily, and serves nearly 8 million customers a day – grow its business? By helping customers manage their supply chains.

UPS' Supply Chain Solutions group – leveraging corporate experience and infrastructure in more than 120 countries – takes over customers' logistics and distribution, transportation and freight, and customs-brokerage transactions. The payback can be seen in 2003 revenue growth of 12.5% from the previous year to $2.1 billion. That represents 8% of corporate revenue – a figure heading to double digits this year, according to VP and CIO Laurie Johnson.

"Customers are challenged by excess costs and want to talk about technology solutions. But they also need to understand it's not that simple. It's not just a warehouse-management system that's needed, but changes to processes, people, and maybe your ERP," she says.

Johnson says UPS doesn't usually set standards for data interchange in the industry, but because it executes so well, users will be attracted to its exchanges. "It's harder than it seems to build trading platforms," she says. You have to be flexible, open, and integrated enough to let millions of companies participate.

UPS will also offer products to meet customer demand for supply-chain visibility, which is becoming a near-obsession for supply-chain managers. It will add alerts and alarms for its Flex Global View, for instance. But if customers can't act on that information, Johnson says, it doesn't help to have it.

Laynglyn Capers, UPS customer technology portfolio manager, agrees. Customers have always tracked packages, but what's changed is the integration of that information into their businesses. "They put it back in their business systems so that accounting, finance, and customer service can use it," he says. Once they know what's inbound or outbound, inventory control, CRM, and replenishment improve. "You may find a different supplier or notify a customer of schedule changes in real time." Visibility itself is a business tool.

Capers' group offers a series of free notification software tools, called Quantum View. A high-end version has exceeded forecasts, with more than 50,000 accounts implementing the system. With Trade Direct, another internal system UPS will offer, UPS will take over the entire freight, tracking, delivery, and labeling of merchandise – from the manufacturer to the store – so the customer doesn't have to get involved.

"Customers want visibility into everything," Capers says. And UPS can help them get it.

– Paula Klein

develop new products and services in a way that would otherwise be invisible to hub participants.

Will BSPs succeed where B2B, ASPs, and the software industry in general have failed? We believe they will. Since the BSP model is community-based, rather than application-centric, it benefits from the dynamic of increasing returns: The more organizations within the community that use it, the more valuable it becomes to participants.

For those who look back and say, "Hey, it's not a new idea," take heart. It was and is a good idea. But good ideas abound; it's the trust and the power needed to shape a community that we often under-estimate, as well as the time and effort required to build new ways of doing business. In the end, most B2B exchanges just ran out of steam. Adam Smith's invisible hand did indeed take us by surprise as it patiently shaped the market in a way few of us would have predicted.

THOMAS KOULOPOULOS is president and founder of Delphi Group, the technology and management advisory arm of Perot Systems. JAMES CHAMPY is chairman of the consulting practice and head of strategy at Perot.

THE 90-DAY PLAN

Before determining whether your hub can evolve into a business-service platform, there are fundamental questions you should ask. After evaluating the level of service your hub offers, ask how it provides higher levels of trust, how it assumes risk for the partner, and what the levels of accountability are.

FIRST MONTH: Benchmark

- Identify the benchmarks for service, trust, and accountability needed in your hub.
- Start to measure the visibility into both the supply and buy sides.
- Evaluate mechanisms, such as intelligence tools that provide real-time indications of changes in buying patterns and trends, to increase visibility into both the supply and buy sides.
- Survey hub participants to identify levels of satisfaction or dissatisfaction.

SECOND MONTH: Set an action plan

- Identify the specific services required to increase liquidity in your hub by providing customers the ability to configure nonexistent products. Most sites don't take the opportunity to identify what customers want.
- Partner closely with the technology/service provider and make sure it has its own skin in the game.
- Create a directory of shared services that suppliers can use to reduce their costs and increase participation in the hub, such as escrow services, process-control standards, and inventory management.
- Develop an outreach program that includes the CIO, to establish the level of trust necessary to move the community forward and to identify areas of strength and weakness in the hub from the suppliers' vantage. Involve key suppliers in the ongoing definition of the hub.

THIRD MONTH: Execute the plan

- As you begin to roll out services, deliver live assessments, such as qualitative metrics for satisfaction, level of service, support of suppliers, and transaction costs.

Smartsourcing

Doing More With Less

The Thought Leadership Board

TAKE HOME POINTS:

Smartsourcing Defined: Leveraging the competencies of service providers in order to achieve a significant increase in total innovative capacity.

Smartsourcing achieves the objectives of lower costs and shorter cycle times while delivering agility and innovation throughout all of an organization's processes.

Smartsourcing is founded on a trusted relationship between the organization and its service partner that supports operational and strategic excellence.

Smartsourcing answers the key question for every organization: not how to be better at what they do, but how to be great!

Executive Summary: Can the seemingly contradictory mandates of cost cutting and innovation be integrated? The view presented in this white paper contends that they must be integrated through the use of an innovative strategy called Smartsourcing, which *leverages the competencies of service providers in order to achieve a significant increase in total innovative capacity.*

With economic confidence building once again, business leaders are presented with a unique opportunity to recast their organizations for the next wave of growth.

Technology developments in supply chain, logistics, self-service, marketing, and e-commerce have driven down transaction costs. Coupled with the cost savings realized from the globalization of work and M&A consolidation, it's now realistic to expect enormous efficiencies in supply-side economics, which will drive down the cost of production and delivery for nearly all goods and services.

What will this mean for your organization? Managers first need to realize that driving down costs is not an episodic phenomenon. Instead, there is and will be a continuing and accelerating pressure to drive costs down. The mantra of "more for less" was never far from the lips of the CFO, but it is now a manifesto for deep-rooted change.

The answer to hurdling this ever-rising benchmark of productivity and cost reduction lies in a new approach to business process and innovation excellence, that includes:

1) *A global view of managing the movement of work within tightly orchestrated business processes;*
2) *A new smartsourcing model for partnering with service providers that creates higher levels of accountability, innovation, and trust;*
3) *A sustained focus on shedding non-core activities in order to invest profitability into core competencies;*
4) *The development of a new competency and science for Innovation Management.*

Our objective in this white paper is to frame this challenge and to describe how *smartsourcing* can take organizations beyond

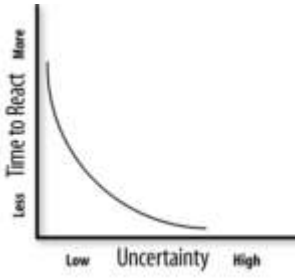
outsourcing to decrease obvious costs and substantially increase business process excellence and innovation through a collaborative partnership – a partnership that responds rapidly to evolving corporate objectives and changes in economic, political, and competitive environments.

A Moment of Crisis and Opportunity

If the greatest advance in 19th and 20th century enterprise came from the ability to fuel manufacturing and increase productivity by moving workers to where the work was, the greatest advance in the 21st century will come from the ability to fuel innovation and reduce the cost of production by moving work to where the workers are. This is the foundation of the recent move to outsourcing. However, it is only the start of a much deeper revolution that we are calling smartsourcing. Smartsourcing looks at how organizations will need to partner with service providers to integrate competencies in order to achieve substantial innovations across the full spectrum of their business.

Organizations are faced with a quandary. How can costs continue to be reduced while innovation and agility are increased?

The Uncertainty Principle: As uncertainty increases the time to react decreases.



To realize the promise of this shift, fragmented business and technology processes must be integrated seamlessly into agile, global enterprise networks – and all of this must happen against an economic backdrop that has created intense ongoing pressure to cut costs.

Organizations are faced with a quandary. How can costs continue to be reduced while process excellence, innovation and agility are increased?

The unfortunate reality is that in a climate of uncertainty and cost scrutiny the natural tendency of most people and businesses is to adopt an overly conservative attitude towards all decisions. Additional time is typically spent evaluating alternatives and over-scrutinizing investments. In short, every decision gets dragged out. The irony is that uncertainty actually decreases the window of opportunity within which to make decisions. Innovation suffers at a time when it most needs to shine.

As uncertainty and market opportunity accelerate, the time to react shrinks dramatically. Information systems and management methods must reign in the tendency towards conservative decision making by synchronizing the time to react with the window of opportunity.

Accelerating innovation and increasing agility requires management and business systems that keep pace with the velocity of uncertainty coupled with a relentless focus on process excellence across the organization, from core competencies to administrative and operational processes.[1]

By improving the transparency of business processes, an organization not only reduces costs but it also increases its speed of execution and quality and integrity of the relationships it has with suppliers. The question, of course, is how can an organization achieve this sort of excellence around all of its processes – those where it has core competency and those were it does not.

Outsourcing	Smartsourcing
CUT COSTS Focuses on cutting costs	CUT COST+ INCREASE INNOVATION Combines cost cutting with increased innovation
STREAMLINE OPERATIONS Focuses on operational areas	STREAMLINE THE VALUE CHAIN Considers the entire value chain
PARTNER ON WHAT YOU KNOW Works well with defined processes	PARTNER TO DEFINE WHAT YOU DON'T KNOW Helps to define all processes from major to obscure
COMMODITIZE Creates homogeneous processes that lack differentiation	DIFFERENTIATE Innovates processes to increase differentiation
TACTICAL IMPROVEMENT Used when markets are predictable	STRATEGIC EXCELLENCE Used to align with shifting markets
DISCONTINUOUS Changes in technologies and architecture are disruptive to the business process	CONTINUOUS Thought leadership combined with constant innovation buffer the business process from technology change
ARMS LENGTH PARTNERSHIP Creates yet another enterprise silo	TRUST-BASED PARTNERSHIP Engenders trust and collaboration leading to greater value

1). This discussion is repeated and elaborated upon in the accompanying article on The xEnterprise Architecture on page 23 of this issue

Smartsourcing is a comprehensive and integrated effort across the organization's value chain to understand, evaluate, and coordinate the benefits of partnering. From strategic innovation to operational outsourcing, the intent is to leverage the value of partnering through an integrated philosophy rather than to compartmentalize and isolate outsourcing partners.

The Many Faces of Innovation

In every organization there are three fundamental types of innovation: creating new products, services or markets; extensions or feature improvements to existing products, services or markets; and increased efficiencies in existing products or services.

Organizations experience innovation in all three functional areas but typically have a core competency in only one of these areas. Dell Computer is not known for innovating new products, but is world-renowned for the efficiencies of its supply chain operation. Apple Computer is known for its innovative product design, not its manufacturing. Many pharmaceutical companies outsource everything from product development right on through to clinical trials, and innovate solely in marketing and sales.

The irony is that uncertainty actually decreases the window of opportunity within which to make decisions. Innovation suffers at a time when it most needs to shine.

One of the first mandates for any organization attempting to achieve process excellence is to clearly identify which of these three types of innovation represent their core competency (i.e. separate the core innovative differentiators of the business from those that are the operational outliers).

An interesting outcome of this analysis for most organizations is that while the areas of core innovative competency may be the source of top-line growth, it is often the non-core areas that consume the largest percentage of your precious resources and management time. Non-core areas consume resources and starve the innovation of your company and are responsible for shrinking or stunting bottom-line growth.

Take the classic case of healthcare. While diagnostics and patient care may be the core competency of most healthcare providers, it is the support and maintenance of facilities and administrative functions that are often the linchpin for holding down costs and achieving near-term profitability and process excellence. The predicament for a healthcare provider is how to leverage innovation in their area of core competency (diagnostics and patient care) while also being best-of-class in the support of their patient facilities and processes.

Business process excellence not only reduces costs, but also increases the speed and integrity of an organization and the quality of the relationships it has with outside parties.

Smartsourcing enables an organization to focus on its core competency while its outsourcing partner takes responsibility for innovating change and cost control in non-core operations. For example, at Harvard Pilgrim Health Care, Inc., a not-for-profit New England health plan with 800,000 members and 22,000 physicians, smartsourcing was used to create innovations in how claims were processed. In addition, creative IT initiatives were used to develop a secure Web application that allows members to enroll, select physicians, view benefits and eligibility information, update family information, and order ID cards online.

By focusing the service partnership specifically on core strategies and processes, the result was an overhaul of Harvard Pilgrim's claims processing systems as well as its overall IT operations. While traditional outsourcing may emphasize replacing systems and bodies, smartsourcing focuses on the core areas of innovation in which an organization must excel to differentiate itself. Through smartsourcing Harvard Pilgrim achieved excellence across its entire spectrum of innovation.

The Smartsourcing Decision

The greatest risk in traditional outsourcing is ignoring a concurrent innovation initiative – this is simply being short-sighted. While outsourcing will often deliver reduced costs, the focus of outsourcing is too

often replicating the status quo. Improving process excellence and promoting innovation are not prime objectives of the outsourcing process, although a good partnership may yield dramatic improvements. Smartsourcing, on the other hand, is accompanied by a renewed attention on excellence and innovation among the organization's core process initiatives. This sort of partnership not only achieves cost savings, but it also establishes preeminence and differentiation. We see the combination of these capabilities as being central to the shift from outsourcing to smartsourcing.

An interesting outcome of this analysis for most organizations is that while the area of core innovative competency may clearly be the source of top-line growth, it is the non-core areas that are most often identified as the cost centers of the organization, responsible for shrinking or stunting bottom-line growth.

The fundamental questions that need to be answered at this point in order to begin understanding where smartsourcing can be of potential value to an organization are:

1) *How core is each aspect of your business to your unique strategic differentiation?*
2) *How good or innovative is your organization at each of these business areas - or, simply put, what is your core competency?*
3) *How cost effective are you at the activities in each business area and how much customer value do these processes add?*

The answers to these questions offer a great deal of insight into those areas that are best suited for outsourcing and those that must be the focus of internal innovation. A smartsourcing partner should help in all of these areas.

There is, however, an important caveat to this exercise, which has been often ignored at the peril of organizations pursuing outsourcing, namely that outsourcing implies absolution. Conventional wisdom favors shedding messy and expensive processes to third party experts, who will operate in a black box. Nothing is further from the truth. In fact smartsourcing requires a much more intimate bond of trust, collaboration, and accountability between the organization and its smartsourcing partner. This partnership may result in higher levels of innovation in core as well as non-core processes. In many ways the smartsourcing partner becomes a watchdog for operational excellence and cost reductions, while off-loading the organization of this burden allows it to refocus attention on core innovative activities.

"…any organization pursuing an outsourcing initiative without also pursuing an innovation initiative is simply being short-sighted."

In addition, this sort of partnership opens the doors to new opportunities for outsourcing processes that otherwise may not have been considered as candidates for outsourcing.

Savvy smartsourcing partners not only encourage this sort of relationship but work collaboratively on an ongoing basis with their clients to identify the areas that are best suited to outsourcing. An open collaboration and a high level of transparency in this exercise are critical to establishing the sort of communication, trust, and long-term understanding of the benefits that smartsourcing can bring to the table. In many cases this means complete disclosure on the part of the smartsourcing provider of the costs and business models used to determine the pricing and performance benefits for an engagement.

An open collaboration and a high level of transparency are critical to establishing the sort of communication, trust, and long-term understanding of the benefits smartsourcing can bring to the table.

But transparency of this sort requires a solid appreciation for the business process being outsourced and a methodology by which to adequately describe, monitor, and manage the outsourced process candidates.

Every organization must answer these questions about its processes in order to understand the full impact and benefit that smartsourcing can have:

Customer Value

How much value does the process add to your customer relationships, lifetime customer value, and market responsiveness?

Differentiation

How critical is the process to your competitive advantage as a distinct provider of this product or service in the marketplace?

Competency

How core is the process to your specialized skills, culture, and market brand?

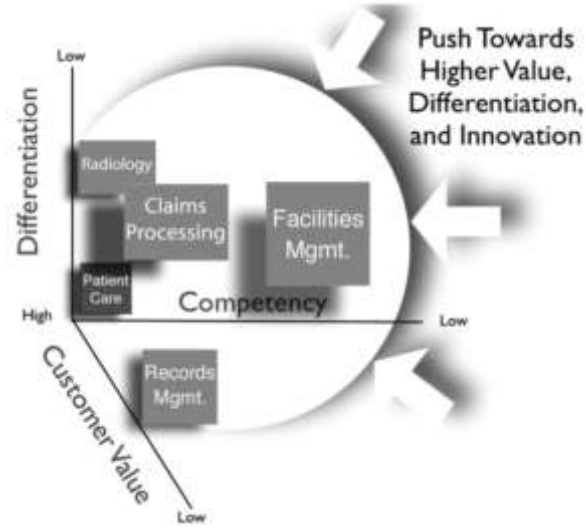
Un-Awareness

In a study conducted by Delphi Group, 50% of respondents indicated that a good idea had more chance of ending up in a startup or with a competitor. Ignoring good ideas doesn't kill them – it just drives them to competitors.

Smartsourcing allows organizations to focus on these good ideas and manage their core strategic innovations with higher levels of awareness while working closely with a service partner to identify innovation for their operations.

Focus on Innovation

Many organizations who pursue an outsourcing relationship operate under the premise that there are a core group of distinct and separate processes (shown here in green) that are candidates for outsourcing. While this can result in dramatic cost savings, it limits the ability of an organization to fully focus on its core competencies, since much of its time and effort is still expended on peripheral processes that do not add high customer value or differentiate the organization in its industry. For example, in this illustration, the health care provider should focus on the core competency of Patient Care.

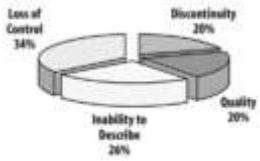


A smartsourcing strategy creates a much more intimate relationship between the organization and its service partner. Smartsourcing increases innovation throughout the range of process from core to non-core, allowing organizations to focus on critical areas of differentiation and customer value, while also achieving high levels of innovation in non-core operations.

Trust at Center Stage

If the first step in business process excellence is understanding the process, then the final step must be developing a new level of trust and intimacy between organizations and their outsourcing partners. Innovation requires intimacy, and it is inherently a trust-based process that demands exceptional integrity of the participants.

Reasons Not to Outsource



A recent Delphi study found that the two top reasons cited for not using outsourcing were loss of control over the process and an inability to describe the process. Business process excellence through smartsourcing provides a much better understanding of the organization's processes, performance metrics, failings, and nuances.

In this respect smartsourcing is a sea change from the traditional model of outsourcing that has been heavily commodity-based. Smartsourcing must achieve a level of intimacy and integration with the core business processes, philosophy, and culture. While this may seem to obviate the need for partnering, it instead changes the model from a pure commodity outsourcing to a critical partnership integrated at the highest level of the organization. For many organizations taking this approach blurs the line of demarcation between partner and enterprise. In the words of one CIO, the service provider becomes a "true technology teammate."

The role of the smartsourcing partner in this context is that of a trusted advisor and executive-level team member with shared values and shared integrity, rather than simply that of a contractor for-hire. In some cases this is taking the shape of actually outsourcing the CIO or CTO role as part of the BPO initiative.

A Turning Point

There are, of course, wild cards in all of this. For example: global labor costs could go up faster than productivity headcount reductions. Government behaviors, with respect to outsourcing, could become more protectionist, limiting globalization. Slow ramp-up of offshore infrastructure needed to support outsourcing could limit globalization. And, counterintuitive economic effects could drive deflation resulting from intense cost-based competition among high productivity suppliers. Still none of these should stop an organization from pursuing a smartsourcing strategy any more than they should stop it from pursuing any other competitive mandate.

Your organization is in a competitive arms race to build the fundamental enterprise information technology architecture that will allow you to deliver on the promise of productivity. But at the same time, the intense changes and discontinuity of IT solutions have created a heavy cost, measured not only in profit, but also in opportunity cost and reduced innovative capacity. The burden to develop and maintain this costly and volatile infrastructure is a steep barrier making it harder to respond to the increasing pressure to do more with less.

Smartsourcing helps you to refocus your business on its core mission and competencies, objectives which may have been long obscured by the fog of technology, but which have always

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You may have built new enterprise systems, optimized your supply chain, and invested in Six Sigma and ISO operational excellence, but chances are most of your competitors did, too. So any potential advantage from these strategies has been fleeting. Short-term differentiation along the periphery of your business does not create long-term preeminence at its core.

You are now at a turning point. It is time to reinvest in those areas that make your organization not just better but those core competencies that make you great.

Smartsourcing provides the framework and the focus you need to achieve this preeminence.

Contact the author, T. Koulopoulos at tk@delphigroup.com

The Thought Leadership Board

This White Paper is a collaborative effort of the Perot Systems Thought Leadership Board (TLB). The TLB has been established by Perot Systems to identify and articulate points of view that are important in developing an up-to-date understanding of the challenges and opportunities faced by organizations considering outsourcing.

By Nathaniel Palmer

The New Process Imperative

A Summary of findings from Delphi's latest research on the business process management marketplace. The full report released in September of 2004 includes survey data for more than 1000 users and evaluators of BPM technology. In this brief excerpt we will look at the three phases of BPM and some quantitative results from the research.

In the four years since this research line first began, roughly the same period that *Business Process Management (BPM)* has existed as an identifiable software segment, the center of gravity for the competitive landscape has shifted from automation and integration, to orchestration and coordination.

Over the last 12 - 18 months the maturation of several complimentary standards (notably those in the Web services stack), combined with advances in the development and application of BPM software, have transformed into a reality what only a few years ago was merely an ambitious pipe dream.

Specifically, these advancements have provided the ability for systems to support business performance and operations by applying sets of goals, policies and rules, while adjusting for context and outcomes not easily identifiable in advance (and as such impossible to script within application logic). This is the notion of *orchestration*, which most visibly differentiates BPM solutions from other categories of software, where policies and processes must be represented within application syntax (if at all) thus furthering the perennial 'IT/Business gap' that has become the greatest impediment to realizing business value from software investments.

Phase One

Business environments are dynamic, requiring the business systems which support them to be so as well. This means that systems must be able to easily adapt to changing business circumstances. BPM offered one of the first real opportunities for achieving this level of adaptability by enabling the separation of business management from systems management within a single environment or discipline. This was *Phase One* of the BPM opportunity – enabling the abstraction of business and application logic.

Phase Two

Phase Two of the BPM opportunity was presented through making orchestration a reality – the ability to connect abstracted application capabilities across orchestrated business processes, transforming existing automation infrastructure into reusable business assets. What separates orchestration from automation is presented by a fundamental shifting in perspective, from thinking of processes as a flow of discrete steps, to understanding processes in terms of goals and milestones. Through process orchestration, it is possible to know where you need to go without first scripting out every single step you must take to get there. Orchestration allows systems to mirror the behavior of the rest of the business environment (one defined in terms of objectives rather than scripts).

Over the last year orchestration has introduced a visible shift in the axis of business computing. As firms realize the opportunities presented by orchestration, it offers (arguably *mandates*) a wholesale rethinking of the role of applications and information systems. We are today in the early stage of this period of transition, with so far only a limited (albeit rapidly growing) community of organizations having realized the potential of orchestration. Yet orchestration has already had a visible impact on the direction of the BPM market, illustrated at many different points throughout this report and within the body of research behind it.

To understand the impact orchestration has had on the market's perspective of BPM requirements, consider the following metaphor. Traditional process automation (predating orchestration) can be thought of in terms of rail transportation – moves across a predictable path and direction (one quite literally "hardwired"). Using the same metaphor (transportation systems) orchestration is more aptly described in terms of a car or other personal transportation. It offers a vehicle to deliver passengers to a desired destination by understanding the rules of the road and milestones along the way, but does not require scripting every single inch along the way (in fact it would be nearly impossible to do so given the unpredictably of such factors as traffic). It also allows for changes in path or destination (just orchestration allows adaptability of process flows).

One aspect that separates personal transportation from rail travel, however, is the need for *visibility*. If you cannot see what is ahead of you, you cannot respond accordingly. In the same way, leveraging orchestration requires visibility into process and business performance, as well as the ability to accurately assess the state of current events and circumstance, and the effect they may have on down stream process activities. Demand for these capabilities is evident throughout the findings in this report, represented in ways such as demand for monitoring, reporting and simulation abilities.

Phase Three

Phase Three of the BPM opportunity, the perspective most frequently represented within this report, should be understood as the opportunity to separate systems from the processes which they support, orchestrate these abstracted components of application functionality across adaptable, context-driven processes, and present the visibility and feedback necessary to leverage the adaptability offered by orchestration.

This leads us to Phase Three of the BPM opportunity, represented by the synergy of three areas of innovation:

1) separating systems from the processes which they support;
2) orchestrating these abstracted components of application functionality across adaptable, context-driven process models, and
3) delivering the visibility and feedback necessary to leverage the adaptability offered by process orchestration.

Orchestration enables a shift from 'command-and-control' management systems. The first two phases of BPM have set a solid foundation for enabling adaptable systems, allowing BPM adopters to respond with far greater agility than ever before. Leveraging this opportunity requires the 'situational awareness' necessary to adapt business systems to a changing business environment – the ability to sense and respond.

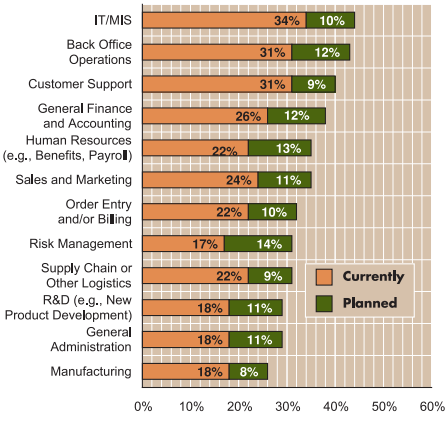
By taking the lid off the 'black box' of automation, the Third Phase of BPM offers a frame-

work for continuously validating and refining an understanding of business performance drivers, and adapting business systems accordingly. This will require a new level of transparency of processes and operations that is sure to present cultural and human factors challenges. But this is nothing new for BPM. At the end of the day BPM is only slightly about technology. It is, instead, mostly about the business and the people.

Where Does the Time Go

Firms with identified BPM initiatives were asked to identify and categorize how time was spent on the eight areas charted below. In general the greatest concentration of activity is found within the *discovery* phase, here represented as the combined efforts of requirements analysis and developing process models and business rules. On average these activities (process and rule analysis combined with requirements definition) consumed about 40% of the time spent on BPM initiatives. Frequently, however, the discovery phase was cited as requiring 50% to 60% percent or more of project time.

Distribution of Project Costs by Activities Within BPM Deployment



This notion reinforces the matter discussed earlier in this report, the critical importance of the design and modeler environment used with a BPM deployment. Getting the project 'right' requires getting the models right, and very often this is the difference between whether or not the design environment offers the flexibility required to adequately capture and/or represent business requirements. Naysayers had often dismissed the importance of this as simply worrying about "pretty pictures" and argued that the real focus should be placed on the integration and integration abilities.

Today, however, most of the market's suppliers have changed their tune, demonstrated by the development efforts over the last 12-18 months focused in no small part on improving the visual and semantic orientation of design environments (including the addition of great simulation and analysis capabilities). Too many projects have failed as a result of "ugly pictures" where early versions of process models hid built-in problems and erroneous assumptions, which were never caught or tested until they had been committed to software.

It is not difficult to appreciate the great difference in cost and effort involved in resolving problems with process and logic designs during the discovery phase versus post-deployment. With that said, however, these differences (i.e., the magnitude of change costs) are also addressed by the quality and agility of a BPM solution's design and reporting environments. Process optimization can be and ideally should be an iterative effort, where feedback from running process models is captured and applied to make incremental, continuous improvements to process designs. This is where simulation capabilities can offer great value, yet there is no substitute for live data. Although it is not advisable to treat end users as Guinea Pigs, live data offers the best opportunity to measure process performance and gauge where improvements might be made. In this regard, the discovery phase is not a discrete event never to be revisited, but is rather the top of the cycle of multi-iterative, continuous process improvement.

BPM Process Teams

In the last piece of analysis we examined the composition of teams involved with BPM deployments, in terms of backgrounds of individual members and in general what areas of the company are involved with BPM initiatives.

BPM Team Role	Average # Represented	Max Per Team
Project Managers	3	26
Domain Expert/SMEs	4	50
Line-of-Business Managers	3	20
End Users	7	50
System Administrators	1	7
System Analysts	3	60
Business Analysts	3	50
Business Process Architects	2	20
Application Architects	3	30
Application Programmers	3	80
EAI Programmer/Specialist	2	30
Outside Process Consultants	2	50
Outside Technical Staff	1	20
Other Roles Not List Above	4	95

Groups Involved With BPM Initiatives

For the first group, respondents were filtered on the basis of those with specifically identified process teams (representing about half of respondents with BPM initiatives) rather than simply teams involved with the BPM deployment. The average composition of these teams is shown in the table above.

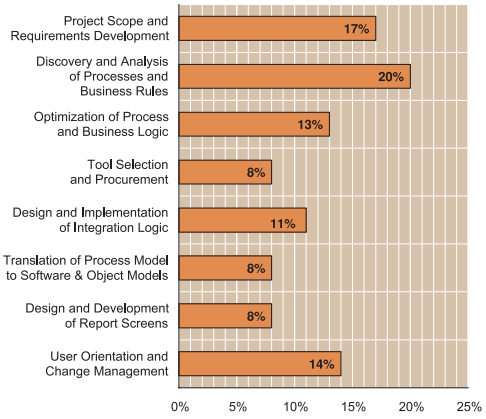
Smaller teams were found to have greater concentrations of members around certain roles. For example, a team of 15 might include *2 Project Managers, 5 Domain Expert/SMEs, 3 Line-of-Business Managers, 3 End Users,* and *2 Sys Admins.* While a team of 20 may have a concentration of LOB managers or SMEs. Yet larger teams were found to have a more even distribution of roles.

The largest team examined (found at a Fortune 50 manufacturer), was composed of *100 Project Managers, 400 Domain Experts, 100 Line-of-Business Managers, 300 End Users, 75 System Administrators, 100 System Analysts, 50 Business Analysts, 15 Business Process Architects, 20 Application Architects, 75 Application Programmers, 20 EAI Programmer/Specialist, 100 Outside Process Consultants,* and *300 Outside Technical Staff.*

Another team examined was found at one of the nation's largest insurance firms, which offered an example of the composition of a group supporting a mature deployment (in this case one with over 20,000 live users). This BPM team is composed of *50 Project Managers, 350 Domain Expert/SMEs, 200 Line-of-Business Managers, 100 System Administrators, 450 System Analysts, 200 Business Analysts, 20 Business Process Architects, 30 Application Architects, 1000 Application Programmers, 1000 EAI Programmer/Specialist, 10 Outside Process Consultants,* and *300 Outside Technical Staff.*

The chart below shows the break-out of where in the organization BPM has been applied already, or where it is expected to be applied in the future (including both areas involved with and who are the beneficiaries of BPM). Not surprisingly, IT rates high, but it is notable that

Composition of Identified BPM Teams



'Customer Support' ranks nearly as high, consistent with other evidence of an increasing role of BPM in customer-facing processes.

From Threat to Opportunity

Digital Rights Management Redefines the Value of Security.

By Carl Frappaolo

DRM places security not on, but within the content itself. Access rights become a part of the content and thus are in context as well.

The protection of intellectual property is not a new issue by any stretch of the imagination. Its roots can probably be traced back to the first carved stone tablet. But the onslaught of technology that totally redefined the parameters of sharing content – the Web, PDF files, e-mail, and peer-to-peer networks to name but a few – has moved the focus of securing intellectual property to new heights.

Many organizations find themselves with a difficult paradox. The powers of the information age are a double-edged sword. They provide seemingly unlimited and unprecedented means of communication, collaboration, and knowledge sharing. Yet, at the same time these innovative approaches to communication, collaboration, and sharing can leave organizations and content owners vulnerable to piracy and lack of security.

And that can lead to loss of potential revenue, loss of control, and, in the worst cases, acts which constitute violation of law and government regulation.

While visionary executives seek innovative new ways to leverage content to increase market penetration, collaboration, and profits, recent rulings and regulations make these same executives cautious and apprehensive about content access. The belief is that security and sharing are diametrically opposed to one another. That perspective is directly rooted in the old definition of security. Under the old approach, security is directly related to the insularity of the system – security is greater as the ability to share decreases. Of course, this limits the value returned from sharing content. Enter digital rights management (DRM) and a new philosophy on the value statement for security. With DRM, the ability and approaches to security are increased and simultaneously so are the opportunities of sharing, and therein lies great new opportunity.

What is DRM?

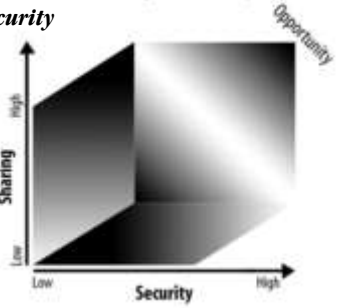
Digital rights management is a technology that was developed as a reaction to violations in protection against the illegal distribution of copyrighted materials. Consider for example the launch of Napster in 1999. This situation gained international prominence and alarming attention from copyright holders. Although Napster's service was ruled against in court, alternative peer-to-peer services (digital distribution services in which clients distribute files between themselves) have appeared. Similarly lawsuits which are "settled" based on e-mail and other forms of content in the wrong hands have also become commonplace.

The Traditional Perspective On Security

Traditional approaches to security are founded in a direct relation-ship between security and access. Higher degrees of security (lower risk) are only achieved through decreased sharing of \content.

The New Perspective On Security

Through the application of DRM, a new perspective is taken on security. With increased granularity on the levels of security and the ability to have security travel with the content, as the levels of security are increased, so too should the ability to securely share or collaborate in creative new ways. Understanding this new paradigm represents a new realm of opportunities for deriving value from content.



DRM is a technology that keeps pace with the innovation and powers of ECM. DRM lets rights holders safely distribute and sell content online without the threat of a loss of control. DRM redefines security, lowering the level of granularity on two fronts. Security is set at the content level – or sub-content level, i.e., at the paragraph if required. The level of control goes beyond simple read/write privileges, providing control over e-mail attaching, forwarding, access only from specified network locations, duration of viewing rights (or number of times viewed), how the content is viewed (e.g., it can be read on screen, but not printed – or an e-book that can be read but not listened to through text-to-voice technology), etc. Most importantly, the security provided in DRM is omnipresent, and dynamic. DRM places security not on, but within the content itself. Access rights become a part of the content and thus are in context as well. DRM permits wide scale distribution of content, without ever surrendering centralized control over the security of that content. DRM allows the altering of rights even after the reader downloads a copy of the content to a local disk. By taking this approach, DRM changes the basic security paradigm. Under DRM, the tighter the security, the more open the system can become, the more widely an organization can allow its content to proliferate, without fear of irrevocable security violations or risk.

Unlike paper-oriented legal restrictions which copyrighted status imposes on the owner of a copy of "protected" data, most DRM schemes permit the creation and enforcement of additional restrictions to be imposed solely at the discretion of the copyright holder/ author/owner. For example, recent ways in which DRM has been used in a business setting include the following.

- Secure and timely collaboration – Organizations involved in a collaborative legal proceeding, such as a planned merger/acquisition, share confidential information via a DRM enabled website. Open sharing of content is allowed, but under certain context – only from certain network nodes, without printing or adding attachments to e-mail, etc. If the merger/acquisition falls apart, the rights of access are changed immediately and centrally. There is no need, as would be in an exchange of paper, to recall copies and ensure that shared content was properly disposed of.
- For your eyes (or ears) only – The sale of content, such as a marketing report, is accompanied by a restrictive license. The purchaser pays for the right to read the report only – and only from a single node address. This eliminates the ability to "share it" with 200 of his/her closest friends who have not paid for the report. This can include the inability to

print – print rights cost more. This model could extend to the manner in which the content is absorbed, so for example, an e-book would not necessarily include the ability to use text-to-speech capabilities. This model can also be deployed to protect the confidentiality of content. Employees of a hospital, for example, can have access to patient records, but only if viewed from certain nodes in the network. Access from dial-up or kiosks in the general public area are not allowed.

- Try before you buy (leases) – DRM enables publishers of content to provide temporary access to the content. This enables new secure business models wherein a subscriber to a market report, for example, gets to view the report for a matter of minutes, hours, or days. After that time the access is eliminated. The access prohibited printing or other forms of sharing. Dynamically, the access time can be extended, based on the subscriber paying for additional time or an outright license to the content.

The approach used must be dictated by the needs of the business model you want to create. DRM should be positioned as part of an overall approach to content management – from authoring and publishing to rights management.

DRM enables these business models by allowing the content owner to change the security rules without having to redistribute the content – or call it back. There are several technology approaches to DRM. Under some architectures, the security scheme travels with the content. In other approaches, the content and access rights remain on a server. Some approaches are only available for certain types of files (PDF perhaps), while others can be deployed on any digital content. In every case, the implementation should provide transparency, only being obvious to the content consumer to the degree you want it to be. Various approaches to authentication are available. You must decide which approach best supports your needs—does the user have to be online or can they be offline? Does the document have to be accessed online or will offline access be permitted? DRM technology typically has four components: content protection, content distribution server, a license server, and a content viewer. Each needs to be investigated and your needs aligned to each.

In the end, keep in mind that these decisions are based on your business, not the technology. The approach used must be dictated by the needs of the business model you want to create. Digital rights management should be positioned as part of an overall approach to content management – from authoring and publishing to rights management. While an appreciation for the different technical approaches is important, and while the end result is somewhat dictated by what technology can and cannot do, the issue of how it will be used, under what circumstances, etc., must be driven by content owners and business owners who have a vested interest in protecting, controlling, and monitoring the use of their intellectual property.

10 Questions To Ask Yourself About a DRM System

- Can the security scheme consistently applied across all platforms, applications, and content types? Does it need to be?
- Does the approach include a methodology and structure to support the roles and approach to security?
- Can the security mechanics be administered centrally and dynamically?
- Is the security secure – does the solution provide the ability to separate security administration from roles and provide levels of access and administration for further control?
- Does the security system and strategy capture both content and context (connections, process, and comments)? Is business continuity addressed?
- What range of security levels are supported (read, write, print, e-mail attachments, etc.)?
- How granular is the security – can it be applied to certain components of a source of content and to certain features of a system?
- Can the security be based on content and context – is it omnipresent?
- Is the security system auditable beyond repudiation?
- Does the security enable or hinder collaboration and innovation?

By Thomas Koulopoulos

The xEnterprise Architecture

A Business Architecture

The xEnterprise is not the result of a steady methodical evolutionary path as depicted in many hierarchical, building block views of business and IT architecture.

Rather it is a loosely coupled confluence of increasingly granular pieces of virtualized applications, business rules, process and infrastructure, held together only by the gravity of business specific tasks.

"Imagine that this new environment will be a desktop which consists of agents, each with a set of rules that ultimately reside in a corporate process library. The agents (think of them as sophisticated desktop icons) reference these rules and recombine them in many ways depending on the needs of the user...and when the rule changes in the repository it is automatically picked up throughout the business operating system."

T. Koulopoulos

THE WORKFLOW IMPERATIVE

Van Nostrand Rienhold 1994

Business in the Face of Uncertainty

The greatest shift in the market has been the increase in uncertainty that faces every organization. Planning horizons have become increasingly tactical and visibility has decreased from years to quarters and from quarters to weeks.

The Uncertainty Principal – Time Value of Decisions

Uncertainty creates a larger number of opportunities, however each opportunity is accompanied by an increasingly shorter window within which to make a decision.

Therein lies the most ironic contradiction in the current dynamics of organizational and individual behaviors. As uncertainty and risk increase the natural tendency of most people and businesses is to adopt an overly conservative attitude towards all decisions. Additional time is typically

spent evaluating alternatives and scrutinizing investments. In short, every decision gets dragged out to the last possible moment. The irony is that uncertainty actually decreases the window of opportunity within which to make decisions.

However, following an optimal function for decision making requires more than good instincts and a solid gut; it requires management and business systems that keep pace with the velocity of uncertainty. Only in this way can we mitigate risk and seize opportunities before they expire. Yet most organizations are hardwired to deal with anticipated problems and opportunities, rather than deliver on-demand services, products, and solutions that are best suited for the precise requirements of the moment.

Evolution of the xEnterprise

So how does an enterprise achieve this level of on-demand capability and agility?

The first thing that becomes clear as you examine any complex business model is that becoming exceptional at your business means becoming extraordinarily efficient at handling exceptions.

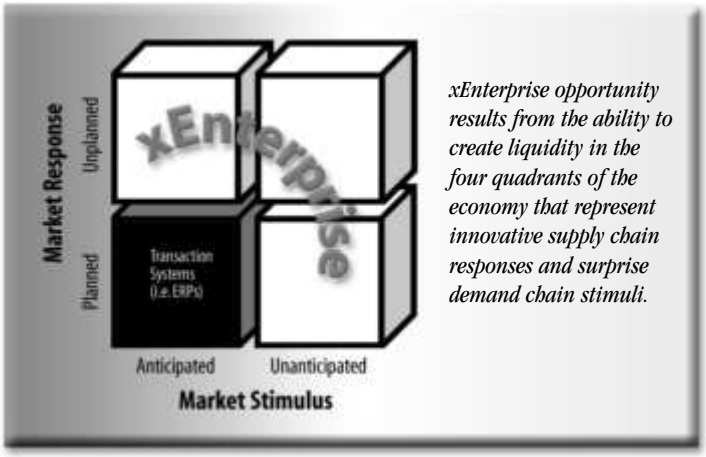
In the current climate of uncertainty and economic volatility exceptions are the norm – it is the unanticipated that we have to prepare our organizations for. Few really important transactions are routine or unexceptional. While this may seem problematic on a logistical or planning level, on a business level it spells significant opportunity to enhance or improve your interactions with employees, partners and customers.

"What becomes clear as you examine any complex business model is that becoming exceptional at your business means becoming extraordinarily efficient at handling exceptions."

One way to simplify this is to plot demand chain stimulus against supply chain responses. Demand can come in two forms: routine (markets ask for products and services that the supply chain knows how to produce); and spontaneous (markets ask for products and services that the supply chain has not yet produced). At the same time the supply chain can respond to both of these stimuli in one of two ways: a predetermined fashion or an innovative fashion. Most old economy models rely on predetermined supply chain responses to routine demand chain stimuli.

Addressing the three quadrants outside of standard, rigid transaction-based systems, such as ERPs that respond to anticipated business stimuli using routine processes, requires bridging systems that were just not developed or even contemplated to work in the same organization, much less the same value chain – what's needed is something far more flexible and dynamic than the relatively narrow solutions available to date.

This is where the world begins to tilt and xEnterprise Applications change the field.



xEnterprise opportunity results from the ability to create liquidity in the four quadrants of the economy that represent innovative supply chain responses and surprise demand chain stimuli.

Simply put, an xEnterprise is a federated approach to building open, integrated business systems that work across all of the platforms, applications, information sources and constituents in a value chain.

Yet, this simple vision has been daunting in practice. The vision of business objects working seamlessly in an orchestrated fashion has been with us since the early 1980s when RDBMS, fourth generation programming languages (4GL) and CASE (Computer Aided Software Engineering) first made their appearance.

But it is only recently that the platforms, network interoperability, and standardization have evolved to a point where they can support the vision of distributed, component-based applications. But, as

we've already said, and perhaps more to the point, the current economic climate has forced a crisis of integration upon every organization. In this economic context there is a tremendous flight to integrated solutions which can provide liquidity in the information and process assets organizations are creating.

Creating a business that possesses the ability to handle uncertainty through agility, and liquidity will require both a practical set of current day solutions to the challenge of integration and a commitment to a new vision of how business and IT architecture work together.

A Technology Architecture

The xEnterprise: The Next Generation of Enterprise Software

Increased velocity, uncertainty and risk in every aspect of business has created intense pressure to integrate the disparate applications organizations use to manage enterprise resources.

While first and second generation integration technologies, such as EAI and portals, offered dramatic advances in the presentation and hardwired interoperability of enterprise and desktop applications, they were limited to very specific points of integration by proprietary APIs and were rarely able to reach out to the critical touch points where customers and partners interact in complex digital value chains.

This is where the interactions among the constituents of a value chain become least predictable and most risky. By orchestrating these interactions and providing a universally integrated platform for enterprise software, next generation integration solutions promise to alter software development, enterprise applications and the value chain in a manner as radical as interchangeable parts altered manufacturing.

The result will be the evolution of Extended or "X" Enterprise Applications, which will consist of componentized parts that work seamlessly across applications and enterprises.

Tilting the Field

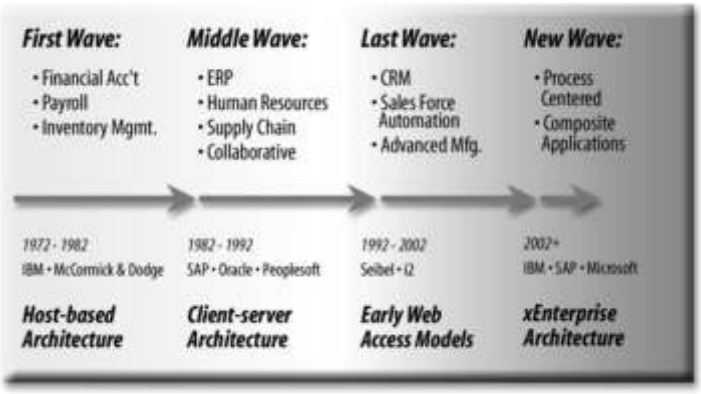
Once every decade or so the market for Enterprise software solutions tilts dramatically causing dominant players and products to lose traction as they seemingly fall off the edge of the market while new players and products rise to prominence.

Our ability to quickly forget the way software platforms can change so dramatically does not serve us well in anticipating the future and seeing the next shift.

"In the current economic and organizational context the most frequent topic of discussion is that of integration."

Consider this, who was the leading software only vendor in 1980? It was not Lotus, Oracle, IBM, or Wang as most people would guess. It was a name long forgotten by most people and unknown to anyone under the age of 30 – Cullinane, which later changed its name to Cullinet and revolutionized the software industry with packaged enterprise (then known as departmental) applications.

These applications allowed enterprises



to achieve greater levels of agility by not only automating many of the mundane transaction-oriented processes of accounting and administration but also allowing for exception processing and modification of these systems over time.

This trend continued from packaged applications, and RDBMS, to word processing and spreadsheets, to ERP and CRM. What each of these tipping points had in common is the degree to which

they created technology platforms for businesses in the face of increasing uncertainty as to their practical application. In other words, none of these technologies was fully formed as a solution when they were first deployed. But when critical mass was reached each one became an immutable factor in the agility and success of a competitive business.

During this same time, however, applications underwent the equivalent of an enterprise land grab as each enterprise software vendor attempted to occupy as much enterprise IT real estate and mind share as possible. No wonder then, given this winner take all market mentality, that in the current economic and organizational context, the most frequent topic of discussion is that of integration.

"Uncertainty creates a larger number of opportunities, however each opportunity is accompanied by an increasingly shorter window within which to make a decision."

However, seemingly adequate solutions insulated from each other within the application stovepipes of an organization are now horribly inadequate for use within an integrated framework. Even closely related enterprise applications such as content and knowledge management or collaboration and information retrieval are most often the result of hardwired solutions integration rather than integrated solutions. The scenario is not unlike taking best of class automobile parts from several automobile manufacturers and then trying to build a working car – which must then be rebuilt each time it crosses state lines in order to conform to local transportation codes.

With this fragmentation across enterprises, digital value chains are anything but integrated. The vast majority of the glue that holds digital value chains together is made of elbow grease and manual intervention in the form of splintered processes that have come to define the landscape of information workers.

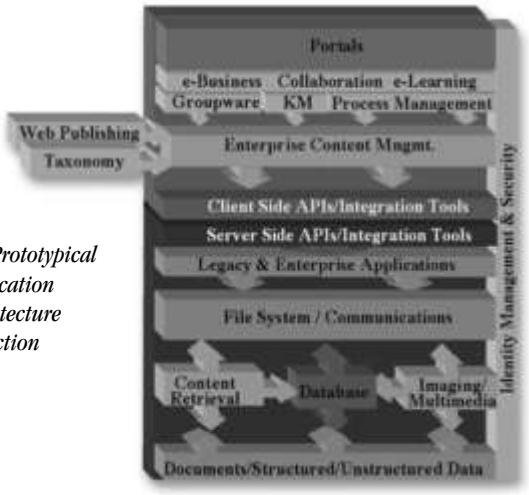
Evolution of Componentization

The neat and orderly block-type depiction of IT that we often see in software vendor presentations is anything but neat and orderly in practice.

These depictions always show some specific technology as the top tier or "Front Line" of IT architecture. However, we are all painfully aware of the "swarm" architecture that has become commonplace in enterprise applications.

"In this economic context there is a tremendous flight to integrated solutions which can provide liquidity in the information and process assets organizations are creating."

During the last two decades enterprise applications have increased in numbers, complexity, size and cost. Despite the enormous reliance on enterprise application, fragmentation has created fiefdoms and poor integration with little practical architecture for future integration. Instead the enterprise application landscape was an architecture built for competition and dominance.



The Prototypical Application Architecture Depiction

However, while applications where evolving, so was infrastructure – that is the basic services shared by all of the piece-meal parts of an enterprise solution. As infrastructure grew in its impor-

tance and became a platform for business transactions, aided in large part by the Internet, it began to subsume applications, as users demanded more basic services from the platform. Generic apps such as Collaboration, Search and Content Management were the first to become part of the infrastructure, portals are following, and process management is sure to be next. The effect is that of a powerful black hole pulling ever more applications into the infrastructure.

The gravity holding together these integrated apps, however, is still hardwired, with EAI. Portals, connectors, gadgets, portlets and myriad home grown patches providing the glue. Although the appearance of the integrated application may have advanced significantly in that last few years through the application of portals, the underlying components are still discreet and mostly incompatible bits of code.

The move towards virtualizing these applications involves three distinct phases of IT architecture evolution.

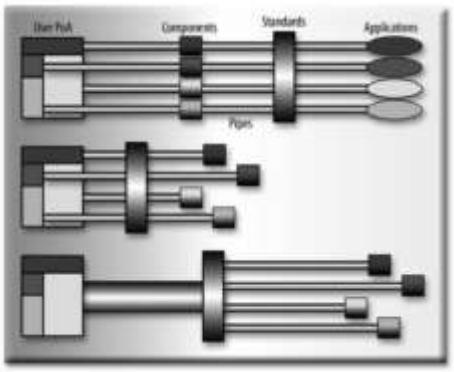
The first is that of visualization where portals have flourished. In this phase large numbers of proprietary connectors were developed by application vendors and portal vendors which would allows the connectors to communicate with or launch specifics subsets of the application. The standardization in this phase was communication-based and primarily between the links from applications to components. You can envision this as a series of very thin pipes, each one developed to facilitate communication between a connector (aka Gadget, Portlet, API) and an enterprise application.

"The tipping point and the key enabling aspect of this architecture is easy to miss but critical to its evolution – a virtual channel through which to broker the services."

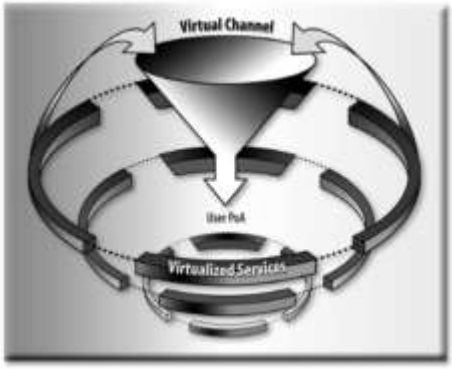
On the other side of the equation an equally large number of pipes would be used to pass the visually homogenized information to a user interface that combined the output of the pipes into a reasonably coherent single presentation.

Over time however the sheer volume of components, their proprietary nature, and the complexity of the visual representation of so much disjointed information working together, although it was never meant to do so, became unwieldy.

The second phase, which we are now entering as an industry, has begun consolidating the chaos by inserting a set of standards between the connectors and the user's point of access. This begins with the standardization of the connectors themselves so that they can interoperate freely with each other and any user point of access. This transformation is key to the componentization of the connectors and is most frequently referred to as the shift to composite applications, since the components can now meld more easily into a single presentation. Standards such as WSRP and JSR 168 are essential for this.



Service Oriented Architectures



Virtualization: Platform Evolution

In the second model componentization allows for greater adaptability in the way end user applications are constructed. However, the components now require increased levels of sophistication in their administration and maintenance. In addition, the components are still being integrated visually as opposed to functionally. In the illustration, this is shown by continuing to use a series of small pipes to deliver the various application and data streams to the user point of access.

This leads to the final phase, virtualization. In the virtualized model, a single virtualized application is delivered to the user's point of access for every instance of use. The libraries of components have now become vast networks of distributed services that can be polled and enlisted on-demand.

Often termed service oriented architectures (SOA), this approach provides the option to bring together applications on-demand at the point of user access by dynamically binding the pieces of the solution. This shifts the field but does not yet tip it.

"The fluidity of collaboration, the liquidity of information – these are the new factors of competitive advantage."

The tipping point and the key enabling aspect of this architecture is easy to miss but critical to its evolution – a Virtual Channel through which to broker the services. In the virtualized model services do not now flow directly from application or infrastructure externalities to the user, as they might with a portal or EAI approach, but rather through a virtual channel based entirely on user internalities.

These composite applications will lead the way to virtualized enterprise applications where infrastructure and applications blur into virtualized services within the next decade.

Fluid, Not Scripted

Although very attractive in concept the vision of an xEnterprise architecture strikes chords of fear for many software marketers since it represents an inherently ambiguous, and as result, difficult to quantify solution in terms of traditional software features or functions. It is also a model that spells increased risk in the vernacular of many CIOs who see it as increasing the number of possible points of failure in an IT architecture.

Whereas traditional transaction-based processes are necessarily scripted and defined when automated with software, an xEnterprise is fluid and requires facilitation, not control.

This is a subtle yet explosive notion that presents one of the greatest opportunities for disrupting the traditional notion of work, and is at the very heart of why componentization matters.

The fluidity of collaboration, the liquidity of information – these are the new factors of competitive advantage.

The xEnterprise is a catalyst, not an end unto itself. It is a reflection of the business environment we are in today, where org charts have become all but obviated, and competitive advantage is more often measured by the speed with which virtual teams can rally together. The post-dotcom era has brought results and execution back into the spotlight. Yet this should not be interpreted as a call to return to outmoded processes and practices. However often the "back to basics" mantra is repeated, we cannot turn back the clock. Work and organization as we knew it has forever changed.

The Evolution of Components

The evolutionary path followed by enterprise applications is consistent with that of virtually all technology:

1) *It is first introduced as packaged applications;*
2) *additional capabilities are stacked on to differentiate competing products; and*
3) *once it has established itself as a viable resource, value comes from decomposing the behemoth package into elemental components, with a framework and standards by which they can be interchanged.*

Consider an analogy that is likely familiar: the cycle of product development which took place in the consumer electronics stereo market. Stereos were originally marketed as self-contained systems. Your first stereo likely came complete with the entire fundamental infrastructure necessary to enjoy music, namely a turntable, speakers, and amplifier in one package.

This configuration had remained consistent from the days of the Victrola (the radio of choice in the 1920s) up until the consumer electronics boom of the 1970s. Yet by the 1970s the role of the audiophile came into its own (music's power user) and the market for stereos became "componentized." Component stereo took each piece of the system out of

the container, made it modular and then optimized it.

Soon there was a proliferation of specialty components such as amplifiers, speakers, tuners, preamplifiers, and tape decks. Rival vendors in each new category led to fierce competition and innovation drove down prices and shortened product life cycles.

Without industry-wide standards in place many competing component manufacturers pursued their own paths and soon recreated the same problems as before. The lack of inter-operability between competitors' products forced consumers into purchasing a single packaged application. The result was a market on the verge of implosion due to consumers bewildered by mismatched components and competing approaches.

Portal Baby Steps

At the end of the last decade enterprise portals first appeared, combining many or all of the functions described above and providing what is today an unrivaled ability to extend the capabilities of existing software, as well as rapidly develop and deploy new Web-based applications.

The first wave of portal applications, however, were delivered largely as packaged applications, each with their own specific domain focus such as search and categorization, report distribution, or business intelligence. These were often positioned as "portal-in-a-box" solutions with limited ability to extend the prepackaged capabilities beyond basic issues of configuration.

In the pursuit of greater functionality and differentiation between competing products, portal offerings increasingly added layers of additional software and proprietary capabilities. As a result, portals rapidly evolved from an access medium to an application framework. Yet many of the same problems have befallen the first generation of portals as they had the earlier packaged applications they were designed to liberate.

The next "killer app" for portals is the ability to decompose the fundamental elements that comprise packaged portal applications into reusable software components. In this way, the role of the portal is that of a delivery platform for multiple sets of application services, rather than a single package of application code. In contrast with the current generation of portal products, differentiation is determined not by the extent of built-in functionality, but rather the diversity of software components the portal supports.

Standards Emerge and the Market Matures

The component manufacturers answered that need by developing packaged component systems. These were all the components necessary to produce music, packaged as a complete system. The problem of integration was solved with specially developed cabinetry that housed all the components.

Standards arose so that components could be interconnected via cables, with consistency across product lines extending to such granular details as the color and size of cable connectors. This for the first time allowed components from different vendors to be assembled into a "best-of-breed" system. Since this development the market for consumer electronics and stereo equipment has flourished with virtually every home having at least one system, and the ability to interchange components between all of them is now taken for granted.

"Today's reality is that of a rapidly evolving business computing environment where the platform is required to support the overlapping lifecycles of new applications."

A very similar cycle is now emerging for information architecture. The first generation applications, delivered as packaged applications, were analogous to the portable record player or consoles. They were ready-to-run applications with minimal capability of customization. Long gone, however, are the days when an organization could deploy a single application with the expectation that it would meet the need for the enterprise for years to come. Today's reality is that of a rapidly evolving business computing environment where the platform is required to support the overlapping lifecycles of new applications.

The greatest threat to the agility of any organization is locking up mission-critical resources within the inflexible structure of yesterday's packaged applications. If the information architecture is to be responsible for mission-critical business architecture then it must be supported with intelligent management tools and sophisticated security services across a wide range of application types. It must be delivered on a secure, scalable, high-availability platform,

with support for wide-scale access. In response to this demand a new environment has emerged for defining, designing, developing, maintaining and expanding application services: the xEnterprise.

The Emergence of Information Architecture

The value of business architecture is to not only deliver the capabilities desired today but to provide the quickest route to what is needed tomorrow. The value of an information architecture is to support this with a commensurately agile set of applications. This requires a comprehensive framework of application services and deployment capabilities to effectively build and manage Web-based applications on-demand based on the dynamic context of an organization's environment.

The charter of today's information architecture is to support and distribute application services into different environments that comprise the extended enterprise or xEnterprise. For example, manufacturers require visibility into suppliers' inventories just as distributors must be able to access shipping logistics, customers seek real-time status on order while sales and service reps require access to this information from the field.

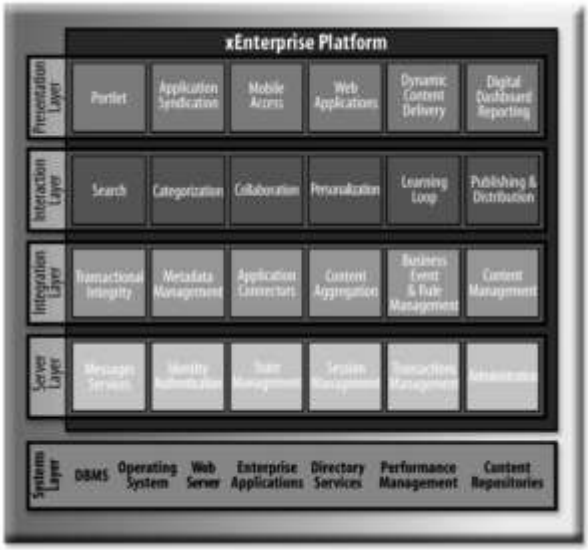
xEnterprise Platform Architecture

In early 2002 Delphi developed a logical architecture to illustrate the functional requirements that define the comprehensive xEnterprise platform. This diagram is composed of four interconnected layers of software and complimentary components (e.g., search, content management, etc.) residing on top of existing systems and infrastructure. This logical architecture is illustrated in the figure to the right.

With the next generation of these solutions comes the capability to easily add, integrate, exchange or remove applications at any time. Just as standard approaches to interfaces and the interchangeability of components were critical to the growth of the market for consumer electronics, so are they for the xEnterprise.

The emergence of standards such as WSRP and JSR 168, as well as the maturing of platforms such as J2EE and Microsoft's .NET are enabling software vendors to focus increasingly on orchestration of interchangeable components, rather than having to embed all software within a traditional packaged application architecture.

Defining the xEnterprise Platform



The layers which define the xEnterprise platform from top to bottom are:

*The **Presentation Layer** provides the access and touch points to applications deployed on the platform. This requires support for a variety of media, enabling pervasive access through multiple device types and application forms.*

*The **Interaction Layer** manages the connections between the user interface and the underlying services and content sources. This layer provides the ability to search and interact with the various resources supported by the platform. Where the Integration Layer manages the logic governing the processes and connections across applications and platform components, the Interaction Layer manages the behavior and relationships of user-to-application connections.*

*The **Integration Layer** contains the rules and logic that tie together business processes and application services. This layer enables the connectivity between platform components and the applications deployed across them, managing the connections, communications and protocols for how information is exchanged and services are accessed.*

*The **Server Layer** provides the portal infrastructure necessary to build and support the applications deployed on the platform. This layer is the workhorse of the platform, providing the ability to run, manage, and maintain myriad Web-based applications.*

*The **Systems Layer** is composed of the fundamental organizational infrastructure such as databases, packaged applications for ERP, directory systems, content repositories and other supporting applications.*

While their fundamental objective has remained the same – distilling the information from many applications into one environment – the charter for enterprise applications has evolved significantly since their introduction more than a decade ago. Addressing this objective requires more than simply the veneer of a Web interface, but rather a comprehensive business platform capable of managing and delivering a complex set of individually personalized, on-demand application services.

xEnterprise Platform Components

Another crucial difference between the xEnterprise platform and that of previous approaches to developing an enterprise application is the notion of decomposing software functions and application services into fundamental elements.

As a result, the ability to recompile and redeploy components weighs heavily on any firm's ability to provide mission-critical business solutions.

"The value of business architecture is to deliver not only the capabilities desired today but to provide the quickest route to what is needed tomorrow. The value of an information architecture is to support this with a commensurately agile set of applications."

The agility of an organization is measured by the speed and efficiency with which it can respond to both internal and external business drivers. Specifically, how quickly is it able to interpret customer demands (inside and outside of the organization) and reflect this in the information and application services it provides?

This requires a platform with agility equal to or greater than the organization, defined by the presence of a comprehensive set of capabilities, the ability to quickly recombine them into on-demand applications, and an extensive set of administrative resources that minimize the overhead incurred by management of the application lifecycles.

Looking Forward

If the idea of an xEnterprise and the three dimensional virtual channel model we've espoused is tough to buy into because if its complexity or the somewhat circuitous route the service takes to get to the user's point of access, consider the analogy of telecommunications. Telecommunications did not take off until it evolved similarly through the use of vast networks. If you had suggested to someone fifty years ago that they would take a route that may involve several thousand miles of network traversal to call someone only a few miles away they would have clearly laughed you out of the room. Yet that is precisely the way telecommunications and the Internet have evolved. Neither is a point to point metaphor but rather an intricately brokered model where even the most basic peer to peer communications are routed through very complex gateways and channels.

"If you had suggested to someone fifty years ago that they would take a route that may involve several thousand miles of network traversal to call someone only a few miles away they would have clearly laughed you out of the room."

The practical reality is hard to ignore. We have entered a period of immense volatility and uncertainty that makes planning a daunting challenge. For our businesses and our economies to survive, the fundamental architecture of our businesses and our information technologies must evolve to keep pace.

In the same way that the foundations of a building remain intact and immutable while the structure may be remodeled many times, the foundations laid for information systems must support an ever malleable business structure, which can take the shape most appropriate to its environment.

The xEnterprise may still be more vision than reality but its mandate is a clear prescription for organizations that expect to remain viable and competitive in the decades to come.

By Hadley Reynolds

On Demand Aftershocks

On Demand/Utility Computing Challenges Services Models.

Take Home Points:

Service providers – integration and outsourcing firms – are weighing changes in traditional business models implicit in the OnDemand vision.

Some larger service providers are responding by building alliances with third-party technology providers that replicate price-fix offerings coming from technology platform suppliers.

At a time when on demand activity on the ground is still experimental, service firms will serve their customers best by driving new models for OnDemand that raise the bar for applications of software as a service. This is not the time to depart from a key element in the current service provider value proposition: vendor neutrality.

Keiretsu for Service OnDemand?

Many larger IT services firms have positioned themselves squarely in the competition to provide IT infrastructure and services for the on demand enterprise. IBM in particular has taken a leading role in defining the business vision and some early delivery models for OnDemand, or utility computing. In our view, the dynamics of utility computing suggest seismic shifts in the traditional roles of computer services firms and technology providers, and challenge traditional business assumptions on all sides. Here we take a look at how these issues are emerging and what kind of market impacts we can expect going forward.

A Glance At How We Got Here

Professionals in IT like to argue that the inherent complexity of the technology, the engineering, and the integration work involved in knitting software, hardware, and networks together to deliver business value justifies the growing share of budget and balance sheet that these services command.

Large IT efforts may well be in a class by themselves. As firms have shifted to increasingly electronic operations, they have built new edifices of information technology one after the other on top of a continually shifting foundation of infrastructure technologies and point products.

The engineering and management demands that have come along with such projects have effectively "baked in" the need for firms to turn to the outside for help. The 40-year growth in the number and scope of partnerships between firms and their IT service providers has

created the huge market in which thousands of firms large and small now participate.

The only problem is that it costs too much to do business this way. The customers of IT service providers, firms of all sizes who depend on these technologies and services, need the budget back.

Enter "On Demand," also known as utility computing, real-time enterprise, virtual infrastructure, and other synonyms generated by the technology industry hype mill. The promise is simple and appealing: less expensive, more transparent, and more effective deployment of IT resources and services to meet business goals. By whatever name you call it, on demand has already moved to the forefront of technology suppliers' commercial messaging.

By whatever name you call it, on demand has already moved to the forefront of technology suppliers' commercial messaging.

Current Activity in Brief

IBM has taken the role of thought leader in articulating the vision of On Demand to describe a set of new models for the way firms will access, acquire, manage, and adapt enterprise IT. The company's multi-year "business on demand" marketing campaign is focused on communicating the possibilities of new opportunities for business gains available through implementing these new models. And the firm offers a number of elements of the vision in various parts of its product lines, primarily delivered by its global IT services organization.

HP has offered a very early productized version of what they refer to as "adaptive enterprise" software, hardware, services. This offer addresses some of the same issues and offers the same business value propositions as IBM's vision, but presents an actual integrated product under the rejuvenated HP OpenView brand.

Microsoft has also put marketing muscle behind the idea of "one degree of separation" between business and the customer, suggesting the pivotal role new service-oriented technologies will play in forging the business infrastructure behind such real-time "mass customization." Oracle has been outspoken in their agreement with on demand ideas, but beyond offering to host some of their applications for their customers, has not announced a major technology or marketing initiative here.

Moving closer to the applications layer, enterprise resource software providers like SAP and Siebel have announced partnerships with major IT platform providers (specifically, as of early 2004, SAP with HP, Siebel with IBM) to offer their popular applications software in a flexible or utility computing environment.(2)

The fact that there is little beyond acquisition detail tangibly changing in the field is a reliable indicator that we are still in the visioning phase of on demand.

Our assessment is that so far, despite the advanced marketing programs under way, most of this welter of current activity amounts to minor modifications to the acquisition and financing schemes under which customers are purchasing technology resources and services. The on demand acquisition model calls for paying on a throughput, usage, or transactional basis, not on the conventional basis in recent years of outright purchase of hardware and "perpetual" enterprise licensing of software. This removes the onus on the customer to tie up working capital in IT "inventory" that may or may not be needed for current business operations, as well as providing a smooth ramp to bring on new capacity on an as-needed basis.

Acquiring compute cycles by the partition or storage by array utilization is not only not new, but is at the moment still not really "real time." But arguably any large business transition has to start somewhere, and these incremental business practice adjustments at least represent a change from the status quo. The fact that there is little beyond acquisition detail tangibly changing in the field is a reliable indicator that we are still in the visioning phase of on demand.

In our view, the group of IT service providers is poised to play a pivotal role in the implementation and realization of the on demand vision.

2.) Find out more about Perot Systems' Utility Computing in the article on page 37

JIT for IT Services?

The Boeing Company executive responsible for the 777 commercial airliner program once succinctly described the 777 as "one million parts flying in close formation." The on demand IT environment will require a similar level of engineering discipline, quality management, reliable uptime performance, life cycle maintenance efficiency, etc. It is no wonder that the kind of supply chain and quality issues that have faced all the advanced practitioners in the discrete manufacturing industries and elsewhere are now entering the discussion of on demand.

The Boeing Company executive responsible for the 777 commercial airliner program once succinctly described the 777 as "one million parts flying in close formation." The on demand IT environment will require a similar level of engineering discipline, quality management, reliable up-time performance, life cycle maintenance efficiency, etc.

But haven't we heard all this somewhere before? We propose that the early on-demand discussion sounds a lot like the discussion going on in the auto industry that led to JIT – just-in-time manufacturing.

Consider the issues auto manufacturers faced twenty-five years ago (35 years ago in Japan) in beginning to try to rationalize a supply chain with thousands of suppliers, mostly small firms, providing increasingly sophisticated parts and assemblies through several tiers of component and assembly subcontractors.

What auto makers sought was a permanent reduction in cost and capital requirements, and a new set of product development and manufacturing practices that would allow them to be much more responsive to their markets. What they could gain with a simplified, rationalized, and higher quality supply chain was dramatic: permanent decreases in working capital required to support large inventories, better prices from fewer suppliers handling more volume, the ability to shift risk to the supply chain, reduced costs associated with handling rejected parts and rework in the production cycle, reduced time-to-market for new vehicle models, and improved performance in order-to-delivery times for customers with specific requirements.

In many ways, large IT services and outsourcing firms play a similar role in final production and delivery as that played by the major auto brands. In the auto context, the just-in-time environment and the rationalization of the supply chain involved a new set of what in IT services are called "service level agreements." These had to do primarily with "integration work" like specifications for metrics on part dimension tolerances, allowable defects per thousands of parts shipped, delivery window constraints, and new kinds of business volume commitments. While the subject matter of software and hardware integration is different, the requirements of on demand for interface compatibility, zero-defect software, uptime reliability, time-to-value, and new kinds of business commitments trace many of the same paths in a similar territory.

In many ways, large IT services and outsourcing firms play a similar role of final product production and delivery played by the major auto brands. In the auto context, the just-in-time environment and the rationalization of the supply chain involved a new set of what in IT services are called service level agreements."

While we think the analogy is thought provoking, it is still important to bear in mind that auto manufacturers do not deliver (or attempt) custom cars in a mass-customized model. Currently, however, the vision of on demand extends to that level of personalized business solution.

The reality is that so far in advanced manufacturing the inevitable trade-off is between standardization of processes and interfaces and limitations on the range of possible product configurations. We still can't order a Ford pickup with a convertible top and Cadillac-like fins, no

It is still important to bear in mind that auto manufacturers do not deliver (or attempt) custom cars in a mass-customized model. Currently, however, the vision of on demand extends to that level of personalized business solution.

matter how much we would like one.

IT services on demand promise to fit the business, like a custom car for each organization, but so far we clearly lack the capability to put into place a rationalized software/hardware supply chain. All service providers will face challenges of technical integration and licensing inconsistencies within a "standardized" configuration approach. Neither IBM or HP have a "just in time" set of on demand software that could operate at anything like the level of the Boeing 777 and its million parts.

At the heart of the challenge is the fact that today there are no industry standardized process models in the IT environment to support even the first level of integration between disparate IT resources or business applications.

At the heart of the challenge is the fact that today there are no industry standardized process models in the IT environment to support even the first level of integration between disparate IT resources or business applications. We are only beginning to understand how to specify such basic things as service level agreements and authenticated interfaces.

Don't expect a personalized IT provisioning environment for your firm to arrive "off the shelf" for a long time. What you should do is make sure your firm's technology and line-of-business executives understand the issues of on demand, and track the progress of product and service offerings as they unfold.

One standards effort is DCML, which has attracted 54 members since its founding in the fall of 2003. The members have tasked themselves with creating a descriptive language to model data center operations, an XML-based language that facilitates communication among the various devices in a data center. The draft specification, however, is not expected until late Q2 2004, already 6 months be-hind the original schedule. Critics would argue that this effort is in reality another skirmish in the ongoing standards wars that IT suppliers use relentlessly to their own ends, and the absence of IBM, Microsoft, HP, and others from the early working groups may substantiate this view in the end.

While it's a great idea to get started on a standard description of the parts, this is a very long way from standardized processes in the industry which might support on demand provisioning of IT-driven business value.

Bottom Line

Don't expect a personalized IT provisioning environment for your firm to arrive "off the shelf" for a long time. What you should do in the meantime is make sure your firm's technology and line-of-business executives understand the issues of on demand, and track the progress of product and service offerings as they unfold.

To get a head start, we recommend beginning to look at business processes across your organization, and also across your industry and its extended supply chain, with an eye to isolating three classes of processes. The important differentiating characteristics of these classes are:

1) *those processes which might benefit from standardization,*
2) *those which will probably not become standard, but could be streamlined through pattern-driven development, and*
3) *those which must remain proprietary for reasons of competitiveness or premium value-add.*

It is the potentially standard group, #1, that will be the source of the first areas to consider for on demand deployments.

Find out more about On Demand see the following article by Pat Richards and Rob Schilperoort of Perot Systems, Utility Computing: Sharing the Risk and Opportunity, which provides an Infrastructure viewpoint on the topic.

Utility Computing: Sharing the Risk and the Opportunity

By

Rob Schilperoort

and

Patricia E. Richards

The promise of on-demand computing, purchased and consumed as simply as power from the electric grid, is appealing on many levels. Yet the simplicity of this image belies deep intricacies in how the infrastructure of a computing "utility" is managed and delivered.

Discussions around utility computing all too often take one of two extreme positions: either a rigid focus on the financial structure that ignores the true business value of the application; or as a business service in an on-demand model, ignoring the value and intricacies of the required applications and infrastructure.

This brief primer on utility computing discusses the value that infrastructure brings to a true utility business services solution.

Utility Computing in a Nutshell

At its core, Utility Computing delivers precisely the right level of computing, network and storage resources across an enterprise as dictated by current business demand. Service providers play an essential role in this scenario by building capacity that can handle peak loads but only charging for the capacity used by customers. Reminiscent of the service bureau and application service provider (ASP) models, the concept anticipates that users will be billed on a metered "pay-as-you-go service" for specific compute power, storage, network bandwidth or software applications used. Instead of replacing installed technologies, companies can incrementally automate their systems, as their business partners and vendors provide shared services that ultimately track and bill at the individual user level. In this way companies can take advantage of shared infrastructure resources, from storage to databases to web servers instead of outsourcing individual applications.

The U-Promise

Utility computing promises to relieve significant pressure points in a company's IT management portfolio by allowing companies to use shared technology resources to get more performance and business value out of their IT dollars while reducing complexity, At the same time it moves the IT expense from the fixed to the variable cost line, manages risk, provides higher reliability and offers IT continuity through volatile, rapidly evolving technology. If done correctly the results should be:

- Infrastructure that can be scaled up or down to meet dynamic growth requirements
- The ability to eliminate the capital spend for over-provisioned capacity needed for peak requirements as these can be activated "on-demand"
- Lowered operating expenses and risk associated with carrying excess asset capacity

- Improved return on IT spend/investment
- Reduces risk of outdated technology

Although the premise of utility computing is simple, discussions of utility computing are incomplete if they ignore the role that business processes play in enabling this nirvana. The ubiquitous objective of delivering services anytime, anywhere dictates that processes and applications become interoperable to enable seamless operations. This means that there must be integration of dissimilar applications across the supply chain, including partners, customers and end-users. That is a tall order that comes with an element of risk that needs to be understood and allocated between the user of the utility service and the provider.

Restructuring Risk

A simple way to look at the benefits of utility computing would be to view it as a means of risk transference, that is a way to offload the risks of infrastructure to a third party. The risks of delivering and consuming services in a utility model are primarily around capacity, redundancy and standardization. For example:

- Will the service scale up when required to support the surprise business opportunity? How will it scale down when that opportunity falls through?
- Who is responsible for any associated technology changes?
- Who manages and who pays for the risk of the spare asset and resources?

Addressing these risks requires more than just delivering greater computing power and storage. It also involves the ability to quickly add skilled personnel and other infrastructure resources, or the ability to de-activate resources that are no longer needed without incurring the added carrying impact and costs. Because of the many nuances of this constant resource allocation the key to correctly implementing a utility-based computing solution will often be balancing the distribution of this risk between the user and the service provider, in other words which risks make the most sense from and economic and competence standpoint to be transferred to a third party versus those that should be kept in house.

A good rule of thumb in risk distribution is to align the exposure to risk with the ability to profit. Each layer of the infrastructure service stack (see the sidebar) has the potential to both reduce costs and to generate additional business opportunity and revenues. Each layer also shares a portion of the risk related to the costs of deploying the services in that layer in a way that can easily scale to meet instant demand.

In today's emergent climate for utility computing, where it is often difficult to fully anticipate the range of issues that may be involved, the relationship you establish in an open and collaborative dialog with your service provider (before and during the deployment of a utility model) is essential to arrive at a balanced risk/cost profile.

The Layers of Utility Computing

Infrastructure refers to all of the components that work together to allow the seamless operation of applications that support business processes. For our discussion this definition includes databases, middleware and messaging layers but excludes specific business logic or end-user interaction.

The definition is based on a three-tiered view of business services.

1) *At the top is the service itself as a function that provides value to the business objective of the organization, either directly (such as manufacturing) or in a supporting function (such as human resources).*
2) *The middle layer is the business application that is aligned with one or multiple business processes or is closely related to the activities and information required for the continued functioning of these processes.*
3) *In support of the application is the final layer – the infrastructure – a set of physical and logical components and services that allow the business application to function.*

Service providers can deliver each of these three layers using numerous delivery models, including as a "utility." What is most important to understand is that in order to provide effective utility delivery of business

services, the supporting application must be provided in a utility model, and in order to provide a business application on demand, the infrastructure framework must be structured to operate as a utility as much as possible. It is this cascading effect of utility computing that is least understood by most organizations that are considering its benefits. If this dependency between the business service, applications, and infrastructure is not created, either the service provider or the consumer will bear considerably increased operational and/or financial risks inherent in a flexible delivery. Utility computing has obvious appeal in a time of cost cutting and heightened business uncertainty. However, its appeal is not temporary. As organizations better understand the risks and benefits of utility computing and as service providers build out infrastructure capacity and delivery models the effect will be permanent and profound. Ultimately utility computing will be a competitive mandate for mere parity and a necessary part of the computing landscape.

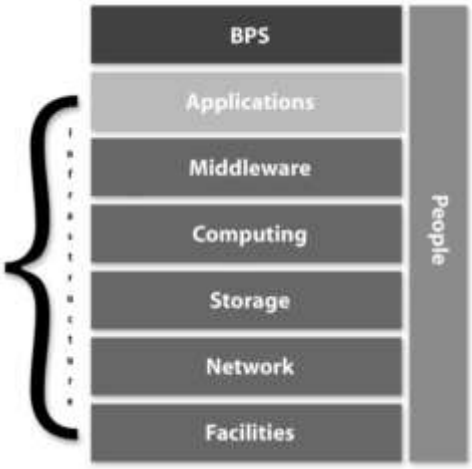
When evaluating the opportunities for flexible delivery, the issue of dependence on "lower-level" services that are structured to be as much of a utility as possible applies to both the infrastructure layer and the full value chain so that the risks can be best managed.

*The **middleware layer** consists of all the software components that do not directly provide business or customer value, including databases, web and messaging servers. The main challenges for the middleware layer include the licensing flexibility of software products. While there is an increase in true software renting that facilitates utility-type services, all too often software contracts and software vendors are far too rigid in their licensing approach. The **computing layer consists** of the servers typically located in the data center. The challenges around this model are the non-trivial capital outlay, extensive use of qualified staff and rapid technology developments. The value that utility computing can provide here is the ability to normalize and align the cost with exact use, shielding the business from the risks related to under- or over-sizing technology development. Developing hardware as a service also provides an opportunity for more platform-independent decisions, thus making more cost-effective choices possible. An interesting side note here is that much of the current push toward utility computing originated with the computing hardware manufacturers, but the result has been a commoditization of their market, more often than not a position that product companies try to avoid.*

*The **storage services layer** is naturally "utilitized" because it is typically managed from a central location, can be configured to appear as a virtual resource that gets turned up and charged for only when used, and can easily be backed up and restored. Storage technologies can offer impressive and easily identifiable value in a rapidly evolving market without too much cost, time, effort or performance impacts within a utility service. This includes the capability to:*

- *Be kept technologically current*
- *Reflect declining unit costs and limit the need for "forklift" upgrades through capacity management*
- *Be right-sized at any given moment to meet the business need*
- *Avoid liability of asset ownership, reducing the total cost of operation*

*The **network layer** has been the most utility-driven of all the infrastructure layers. The network market has benefited from multiple vendors, shared and virtual private networks both persistent and personal, as a result of the huge increase in bandwidth as part of the Internet bubble. The lesson learned here is that utility computing often requires and aggressive level of up front funding to drive overcapacity. While we are unlikely to see a repeat of the ramp up in networking capacity in other layers infrastructure it is fortuitous that the networking layer has already undergone this growth spurt since it is a prime driver of utility computing.*



*The final layer and the basis for all infrastructures – **the facilities** – has a clear capital outlay issue. This seemed to have been addressed for a while with a co-locations business model. When many of the key businesses in that market folded, the same issues came back. Only very large infrastructure organizations or infrastructure business aggregators like outsourcers have the capacity to truly create a utility of this service.*

By Nathaniel Palmer

TECHNOLOGY MANAGEMENT STRATEGY

A Market Assessment of Current Practices and Expectations of Commercial Software Buyers, With Analysis of Next Generation Open Source Licensing and Delivery Models.

Open Source 2.0

Commercial Class Software With Open License Flexibility

Open Source 1.0: A Brief History of Free and Open Software

The first commercial computers came with "free" software which included source code allowed to be freely shared. It was not until the 1970s that independent commercial software was first widely available, by which time competitive forces had lead to increasingly closed-source architectures and restrictions on redistribution. The decades which followed saw both explosive growth in software development and rapid declines in the cost of computing power.

Hardware moved rapidly towards commodity status, while software became increasingly proprietary and redistribution restrictions were enforced at an increasingly aggressive rate. This trend led to two sets of circumstances whose repercussions now hold the potential to redefine the software industry:

1) communities of programmers have ready access to hardware horsepower, but find the latest and greatest software tools out of reach;
2) commercial developers seeking to differentiate their applications developed increasingly closed and proprietary software.

By the late 1970s, the growing cost of software first inspired the early seeds of today's open source movement, including the GNU Project and the Free Software Foundation. For the decades to follow, the open source movement grew within communities of hackers who viewed commercial software as a cultural anathema. Yet the innovations these communities produced were largely relegated to command line UNIX, with little impact on end user computing or commercial software sales.

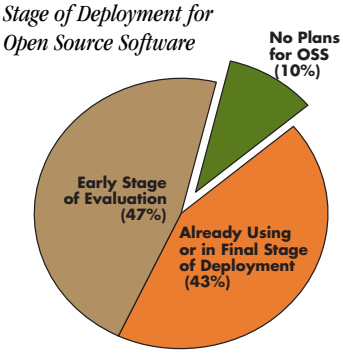
In the 1990s, however, the open source trend line hit an inflection point. As a result of maturing standards (such as HTML and XML), the open orientation of the Internet, the evolution of Java and J2EE, and the success of initiatives such as *Apache*, *Linux*, and *MySQL*, the term "open source software" has become part of the modern business vocabulary. Today open source represents one of the greatest opportunities for both buyers and sellers of software, offering what is increasingly viewed as a viable exit strategy away from the trappings of the software oligarchy and the rising cost of proprietary licensing.

Shifting Sands Across the Software Landscape

In a Delphi Group survey of several hundred software consumers, nearly half of respondents agreed with the statement that open source represented *"an emerging area about to revolutionize the software industry,"* while another 10% cited open source as *"already the best way to go for software development and procurement."* Interestingly, when the same questions were put to software developers the responses proved even more favorable to open source.

The open source licensing model allows software to be freely shared, shifting competitive differentiation among software publishers from proprietary code to the quality of support and services. By shifting the point of competitive differentiation from proprietary code to openness and adherence to standards, open source holds the potential to radically alter the economic equation that has defined the software industry for the last 3 decades. There are few, if any, developments in commercial computing which have evolved as quickly as the adoption of open source. This is driven by a combination of Internet-delivered software (i.e., downloadable code), maturing standards, and of course, a price point that is either free or virtually free compared to closed-source equivalents.

Stage of Deployment for Open Source Software



The first wave of open source software to impact commercial computing was at the server level, notably the explosive roll-out of Linux since the late 1990s, and the less visible but equally pervasive adoption of the Apache Web server family. What paved the way for these and subsequent open source initiates, however, was not simply the low (or arguably nonexistent) price point, but the democratization of application development by J2EE and its constituent set of community-driven standards. For this reason, most commercial adoption of open source has been on the J2EE and/or Linux/UNIX platforms.

The most commonly deployed open source today includes the *Apache Jakarta* projects (Java-based server-side tools), the *Apache Tomcat* servlet engine, the Eclipse Java-based development environment, the JBoss J2EE application server, and tools such as the *PHP* scripting language and the *Samba* Windows-to-Linux integration software. The most widely deployed open source software is Linux, which is today also the most widely installed UNIX variant and by far the one with the most rapidly growing market share.

The object-oriented, component-orient-

Snapshot of Research Methodology

In March of 2004, Delphi Group surveyed several hundred large and medium-sized businesses, as well as government agencies and large universities, regarding their use of and attitudes toward Open Source Software.

Organizations examined include large consulting firms including EDS, Accenture, and CSC; large medical services firms such as the Mayo Clinic and Carle Clinic; Engineering and manufacturing firms such as Alcoa, CDM, and Elekta; firms in the energy sector such as SPL WorldGroup and Santos; United Stationers Supply Company, North America's largest business products wholesaler; pharmaceutical firms including Lattelekom and Novartis; publisher Penton Media; as well as non-profit firms such as Mercy Ships. Also surveyed were several universities and government agencies including the Federal Aviation Administration, the U.S. Congress, and the State of Nevada's Department of IT.

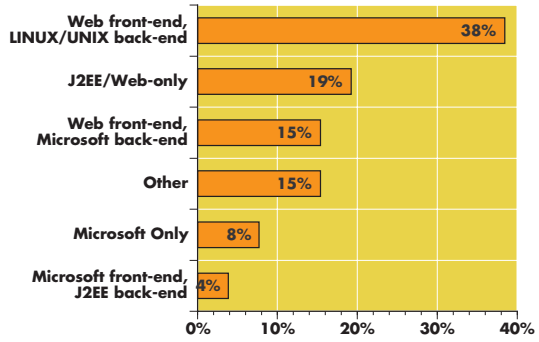
The responses presented in this report reflect only those of users and internal application developers (e.g., software consumers). Responses from commercial software developers, resellers, consultants, and integrators were not included in the analysis illustrated in this report.

ed, standards-based architecture of J2EE has hastened the development of multiple open source projects initiatives, such as those under the *Apache Software Foundation (ASF)*.

The ASF community represents over 1,000 core developers and over 50 active projects. Organized as a nonprofit association, ASF is a meritocratic community governed by a core set of laws and principals (known as *Foundation Bylaws*). Projects are vetted and approved through a peer-review process involving both users and developers, comparable to what would be found in the QA process of commercial software development.

Spending Impact: Economic Consequences of Open Source

Deployment Environments Where Open Source Software Hasor Will be Used



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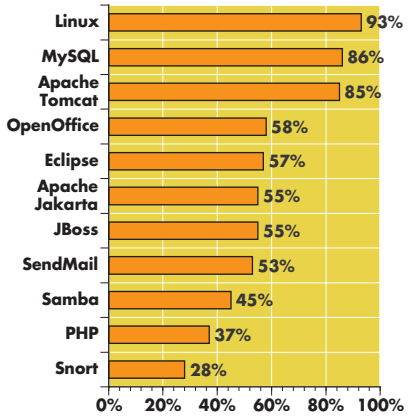
One of the fundamental arguments forwarded by open source detractors is that without commercial incentives based on proprietary intellectual property, software innovation will cease and ultimately software consumers will suffer.

The economics behind ASF and other community-based open source initiatives are that of reciprocity. Specifically, the contributions to the development of open source software will be rewarded with access to works provided by other developers.

The argument that open source removes economic incentive, however, is contradicted in part by the fact that 20% of the firms surveyed indicated they would spend more on IT as a result of available open source applications.

Expectations for increased spending are likely the result of the lower entry point offered by open source, rather than the expectation that open source will be more expensive than closed-source alternatives. Twice as many firms indicated they expect to spend less, which might be taken as fodder for open source detractors. This statistic likely ignores the fact that with a lower entry point, more projects will begin and ultimately these projects will lead to more software-based business activity. What is indisputable, however, is the fact that open source is already resulting in major changes on both sides of IT spending, with only 20% of firms citing "no impact" as a result of the availability of open source options and alternatives.

What Open Source Initiatives Do You Use Today or Will Likely Use?



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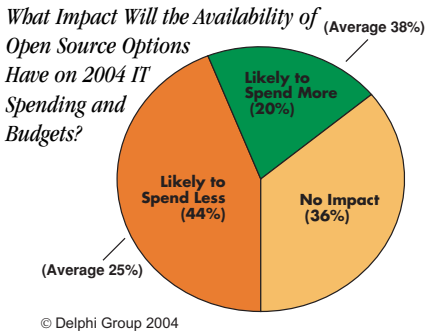
What Impact Will the Availability of Open Source Options Have on 2004 IT Spending and Budgets?



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Open Source 1.5: Free Software; Commercial Services

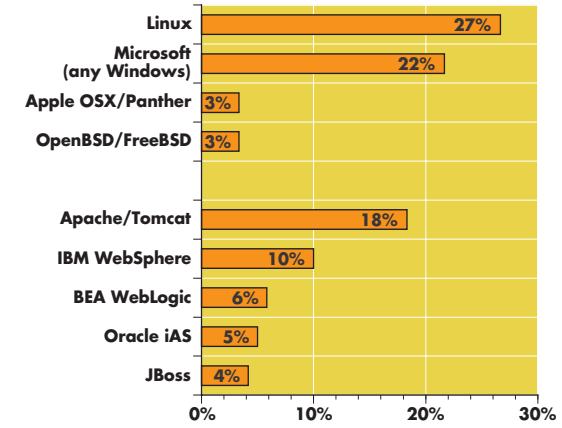
Whereas the first few decades of the free and open software movement saw little commercial traction, the first real commercial opportunities evolved through the offering of free, open source licensed software (what we will call 'Open Source 1.5') with

billable services around maintenance, support and custom configurations. The commercial model behind this generation of open source is more about services than software. Software is the result of a community of developers, not a single commercial vendor.

Where differentiation and specialization come into play is not with regard to software development, but rather the services around a specific open source project, such as Linux. For example, commercial firms engaged in this generation of open source (such as *Redhat* and *Jboss*) provide free access to open source software and charge fees for services such as technical support, software customization, and application development.

The Open Source Infrastructure "Stack"

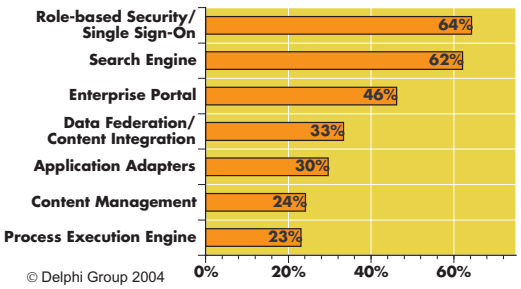
Anticipated Platform for Next Open Source Deployment



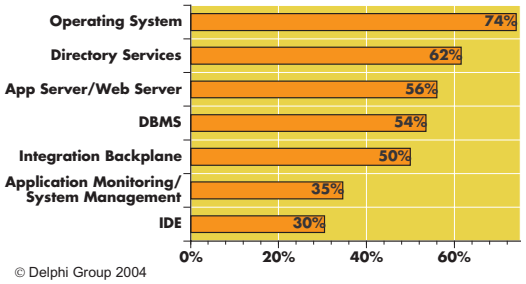
Adoption of the first generation of commercial open source has been defined less by packaged applications than piecemeal components as part of a larger Web infrastructure. The continued development of both standards and prepackaged components has followed the growing demand for a complete infrastructure "stack" or set of foundational services and capabilities. Perhaps the first available open source stack was the Internet *Application Platform (IAP)* comprised of a core set of components commonly referred to by the initials "LAMP": *Linux, Apache, MySQL, PostgreSQL, PHP* and *Perl*.

Components Deemed Either "Absolutely Necessary" or "Significantly Important" in the open source infrastructure Capabilities "Stack"

Value-Added Capabilities



Foundation Services



LAMP offers a baseline of capabilities to rival closed-source alternatives, such as *SunONE, IBM WebSphere, BEA WebLogic,* or *Oracle iAS* (each of which leverages open source components, yet do not pass on to consumers the benefits of open source licensing). What it provides is a basic set of foundation services rather than addressing the more sophisticated requirements for today's organizations seeking to develop composite applications.

Enabling dynamic business applications requires moving "up the stack" with additional capabilities focused on a more robust presentation layer, as well as access provisioning, process execution and information management tools. Delphi defines the *open source infrastructure* stack as consisting of a core set of components loosely grouped into two sets of capabilities:

Value-Added Capabilities

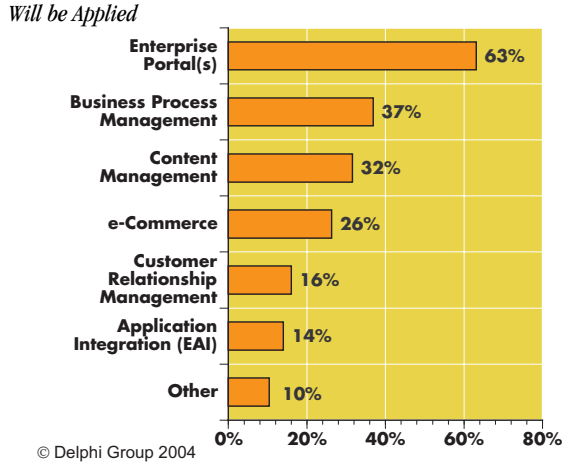
Application Adapters, Content Management, Content Integration and Data Federation, Enterprise Portal (presentation layer and UI), Process Execution Engine, Role-based Security/Single-Sign On, Search Engine

Foundation Services:

App Server/Web Server, Application Monitoring/System Management, Development Environment (IDE), DBMS, Directory Services, Integration Backplane, Operating System

Illustrated in the charts above, respondents were asked to rank the open source capabilities and components listed, based on what they deemed as necessary to a "complete" open source infrastructure stack. The foundation services at the bottom of the stack provide the basic building blocks and server-side resources for running, managing, and integrating applications. These capabilities provide the "horsepower" for open source infrastructure stack. For these capabilities, the commercial drivers are largely rooted in cost reductions – they're free to acquire and arguably cheaper to run and manage. These were largely developed and supported through the system of reciprocity described earlier in this report. For commercial providers of open source infrastructure stack foundation services, the business model is based on value-added services, ranging from support and customization to management and delivery of software updates.

Application Areas Where Open Source Software Will be Applied



As these capabilities further commoditize the market for server-side software (such as operating systems and application servers), the point of competitive differentiation among both traditional software "stack" suppliers (*IBM, Sun, BEA Systems,* et al.) and open source infrastructure projects continues to move up the stack into value-added capabilities.

Shifting the Target From "Cheaper" to "Better"

As indicated by the chart to the left, firms deploying open source software are targeting the enterprise portals by an overwhelming margin (better than 2-to-1 over any other application area). Managing business process was cited half as frequently, but also twice as often with integration middleware (EAI). These data points help validate that firms increasingly see open source licensing and open source infrastructure stack investments as an environment for building, managing and maintaining collaborative Web applications, rather than simply running server-side software (as is executed by the foundation services in the lower half of the open source infrastructure stack).

Firms embracing open source software and infrastructure today are most often doing so in order to build collaborative, Web-based applications. These firms are pursuing open source options primarily to realize a lower total cost of ownership.

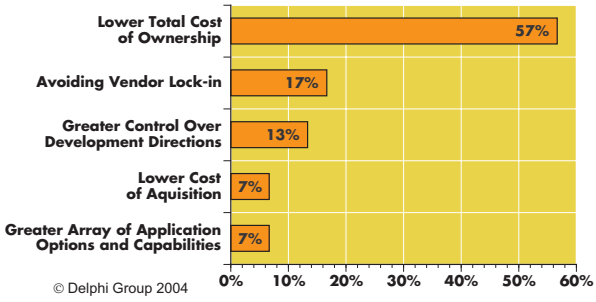
For this reason, the manageability of open source has become a key consideration for commercial open source investments. Decisions are not made simply on the basis of what is cheaper to acquire, but more so the long-term financial consequences and benefits of ownership. This point is validated by the fact that more respondents cited *"lower total cost of ownership"* by a ratio of nearly 10-to-1 over *"lower cost of acquisition"* when asked to identify the single greatest driver for open source investments.

Just as the bottom of the stack has benefited from standardized J2EE protocols such as *JAAS, JTS, JMS,* and *JNDI*, standards represent core drivers for value-added capabilities and enabling a lower cost of ownership for open source infrastructure. Recently, the coalescence of a set of both J2EE-derived and service-oriented standards have emerged which greatly enhance the ability build and deploy

both user-facing and distributed applications on the open source infrastructure stack.

These standards help simplify the integration overhead required with combining individual open source projects into a more unified framework or facilitate connectivity between dedicated software

Single Greatest Benefit Motivating the Adoption of Open Source Software



functions, such as process execution and security/access provisioning. Examples include WSRP *(Web Services for Remote Portlets)*, which allows users to customize portal environments through point-and-click integration of standards-based portlets from any WSRP-compliant portal server.

WSRP and distributed, standards-based access control mechanisms such as *XACML (eXtensible Access Control Markup Language)* enables more administration functions to be delegated to users, while still maintaining centralized governance policies.

Leveraging these standards to delegate administration and empower users, allows for a decreased reliance on system administrators and other IT staff, without comprising content or data security. In many organizations, this should open the door for significant advantages in the reduction of software ownership costs. For these reasons, as well as increased portability of development efforts, standards will remain central to driving open source adoption. Neither standards alone nor "free" software licenses, however, fully guarantees reduced ownership costs.

Given that the greatest component of ownership costs comes from the cost of labor, both personnel and services required for customization and support, open source that is free to obtain but labor-intensive to manage present no economic advantage over proprietary alternatives subject to more rigorous QA processes.

Open Source 2.0: Commercial Class Quality, Open Source Advantages

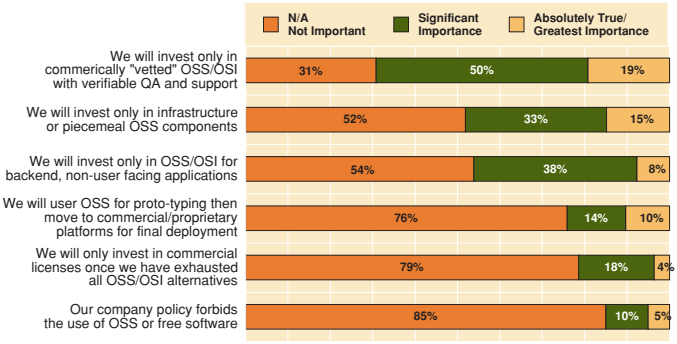
For open source software to be readily adopted by a majority of commercial software consumers, offerings must be able to demonstrate a standard of quality consistent with proprietary, commercial alternatives. This arguably exists already at the component or project level, but must also be demonstrable up the entire stack of open source infrastructure.

An overwhelming majority of responses (70%) cited the need for commercial vetting of open source offerings as the leading requirement for investment and adoption. This requirement is consistent with the 10-to-1 favoring of ownership costs over acquisition costs in the identification of perceived open source benefits.

The ability to provide commercial class quality within open source software is a function of both the licensing model and delivery mechanism for bringing software to market and into the hands of commercial buyers. This does not necessarily mean "free" software, but it does necessitate that "open" licensing be paired with validation, testing, support and maintenance.

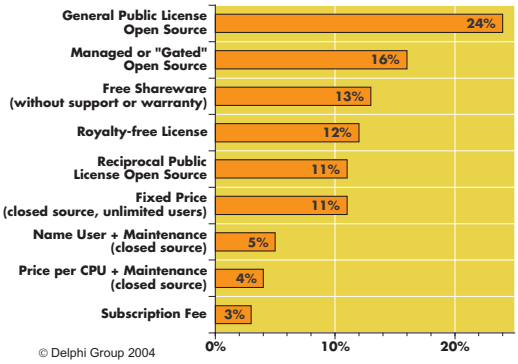
One of the early barriers to commercial open source adoption was organizational policies forbidding the use of "free" software. This issue has largely waned, while acknowledgment of the need for commercially vetted open source dominates adoption criteria. Commercial software buyers today seek open source solutions with demonstrable quality assurance processes, and confirmation that integration complexity otherwise involved with combining piecemeal software components has been successfully addressed.

Ranking of Attitudes Towards Open Source Adoption



Free and Open Software Licensing Models: Myths and Realities

Preferred Licensing Model for the Next Enterprise Software Investment



For many "open source" is understood to be synonymous with "free." As a result it is often erroneously assumed that open source software cannot be sold. Truly free software, however, is more commonly licensed as "shareware" where source code is closed, but the software maybe freely shared and installed, but not modified or embedded. Similar misconceptions surround "royalty-free" licensing, which provides for a one-time right to integrated code with other applications, typically for an embeddable software engine, allowing ownership of and the right to resell derivative works.

While open source may have been born of the free software movement, the defining characteristic for open source licensing is not the inability to charge a fee for software, but access to source code. Each open source project family (e.g., *ASF, GNU, BSD,* etc.) has developed its own specific licensing policy, but all are based on a variation of one of the following:

Reciprocal Public License: provides reciprocal rights to all changes, but does not allow for resale or licensing of derivative works;

General Public License (GPL): free to install and share, but does not allow for proprietary change or licensing of derivative works;

Lesser General Public License (LGPL): allows components of free software to be embedded in proprietary licensed applications;

Managed Open Source Licensing: combines support and maintenance benefits of licensed software, as well as ownership and licensing of derivative works.

Without limitation to specifically targeted open source investments, by a significant margin firms indicated a preference for "free" and or open software licensing models for their next enterprise software purchases. Although the implied endorsement of free licensing may belie the more frequently stated requirement for stable, tested, and commercial class software, these findings underscore the growing momentum away from proprietary, named-user license models.

The model which most closely follows the requirements we find for commercial software consumers today is managed open source.

Open Source 2.0 = "Managed Open Source" Licensing and Delivery

Managed open source licensing offers a combination of support services and software updates to open source licensed software. Under this model a commercial vendor assumes the responsibility for testing

and validating either internally developed or community derived software updates, delivered over network-based Web services. Early variants of this model include the *RedHat Network*, which offers subscription-based services for delivering updates to RedHat Linux platform.

Summary

Open source is already shifting the power curve from the software vendor back to commercial software consumers. The recent research presented in this report illustrate that a majority of firms already view open source as a strategic lever to lower the cost of development and maintenance of enterprise software. This is based not simply on the availability of "cheaper" software, but the expectation of a lower total cost of ownership enabled by the combination of open source flexibility and commercial class capabilities.

By

Dan

Keldsen

Death of a Salesman?

Birth of Relationship Intelligences.

EXECUTIVE OVERVIEW:

Social Networks (SN) are fast becoming the new killer app of the Internet. But what is the killer app of SN?

In this article Dan Keldsen, Delphi's resident "guru on the edge" looks at how SNs may change the way organizations sell their products and services.

It started sometime in May of 2003. A steady barrage of requests into my e-mail from folks that wanted to be in my network. The volume was rivaled only by the mounting tide of spam and for a while I dismissed both with equal dispatch.

I was bombarded by requests to join such services as Tribe.net, LinkedIn, Ryze, openBC and a long list of other public social networking systems (SNSes). Eventually, I gave in and plumbed the depths of these systems. After interviewing roughly 100 users of social networking and creating my own network of nearly 638,900 "friends" I can safely say that 'something real is afoot' in this world of SN.

For the uninitiated SN often looks very much like Knowledge Management (KM).

Not that long ago, plenty of people derided KM. Some of the larger, more expensive, and convoluted KM systems certainly proved the point! They had escalated a complex concept (getting knowledge trapped in brains out to the free world), into a hideously complex system as they attempted to codify every bit of implicit and explicit knowledge that might poke its head out of office cubicles. Other than providing plenty of fodder for Scott Adams KM amounted to little more than hyperbole. It wasn't long before many declared KM dead, and good riddance.

With SN, at least ONE guise of KM has resurfaced with a vengeance, the ability to form communities of interest and to identify expertise. KM was about separating knowledge from people. SN is about connecting people to each other. Knowledge of and about People, Expertise Location, Strong and Weak Personal Relationships – all this is information that can be turned towards sales opportunities, job seeking and job placement, market mapping (literally mapping your customers and their conversations), team creation, and so on.

The SN Sales Play

In 3 to 5 years we will no longer recall when SN technology wasn't sitting next to us (virtually), identifying and even seeking out relationships through our extended and shared public and private (i.e. enterprise) network of contacts. All this makes SN an indispensable and irresistible tool for any salesperson pursuing enterprise software sales.

For many reasons, selling enterprise software is a difficult road to travel. Systems are complex, and expensive. They potentially touch and often disrupt people and existing systems in the process of implementation. Further, the natural inclination for most buyers is to protect their budget, parting with it grudgingly, particularly at this point in the post-boom. With budgets for perks on the decline, it is increasingly difficult to win over new clients. The power of solid relationships and personal introductions from a trusted, or at least a KNOWN person to the buyer, may tip the scales in these situations to create a neutral if not positive-leaning attitude by the buyer.

Some salespeople are naturally adept at knowing and tracking a wide network of connections, keeping their network active and in touch. Realistically, most people are not willing to put the effort into 'doing networking well'. Those who fall into this camp stand to gain tremendously from SNSes that do this work for them. Those who are naturally oriented towards relationship management will gain further magnification of their networking efforts.

Let's be clear about this, we are talking about identifying the VARIOUS ways that people may have some relationship, and this is the key to why SN is going to be a part of our IT fabric very soon. In some cases, ANY sort of relationship at all between people may be enough to be useful. In other cases, it is a specific type or strength of relationship, or information about the people involved in these relationships, that provide real benefit to those using a SNS.

Everyone has some sort of personal network, and between these networks there is at least some overlap. If I know you (in any capacity) and you know Bob, then Bob is 2-degrees away from me. There is a fairly good chance that you would introduce me to Bob and that Bob would accept the introduction. There are many SN advocates that would say "And then you close the sale and move on to the next network connection." I am not claiming that SN by itself will turn anyone into a fantastic salesperson, or immediately and always discover the people and companies that are 100% guaranteed to buy now or in the future.

However, as most salespeople will acknowledge, cold calling is a frustrating experience for all concerned parties. Successful use of SN by BOTH buyers and suppliers (and the intermediate 'degrees of separation' – think Kevin Bacon), the networks that are formed help create bridges that begin to automatically connect people of like minds, or with at least SOME similarity of experience, background, hobby, prior employer, physical location, etc. This creates a connection between parties that would otherwise have no concept of one another's existence.

It's Not What You Know, It's Who

We can use the well known Knowledge Management grid, to illustrate these relationships:

In 'traditional' KM, this grid represents that holy entity "Knowledge," but in this instance, we're speaking of ANY knowledge, about people. To illustrate SN for you, assume that you "Know Who You Know" (KWYK) – that is, your immediate, directly connected network of relationships. This is no doubt not a very large number, and easily map-able and track-able.

There are plenty of named people that you "Know Who You Don't Know" (KWYDK) – for

example, Bill Gates. There are also people that you "Don't Know Who You Know" (because they are your sister's, best-friend's, entrepreneurial uncle). And there is the rest of the known universe (unknown to YOU), those in the "Don't Know Who You Don't Know" (DKWYDK) camp.

638,900 of My Closest Friends

By layering the people networks of the people you directly know (KWYK), with the people networks of THOSE people (providing the DKWYK quadrant), and continuing on out to the famous "Six Degrees of Separation," you have a gigantic potential pool of people that you have at least some tentative connection to. This mass of people gets very large, very fast. However, once you start connecting to people, you will find there are connections that link back to people already in the extended network.

The potential of this made me wonder, why did it take so long for automated SNS to come about? Do you recall the revolution of relational databases? If so, you may recall a major issue that fledgling database administrators were warned of: "Infinite JOINS are bad!"

In general, unintended programming loops are bad – and are known to lock up systems and cause chaos. Today, however, systems are fast enough to make these relationships between thousands to millions of people identifiable and contactable in nearly "real-time." The idea of a 'constrained infinity' makes it possible and useful to chop these feedback loops at somewhere around 6-20 degrees of separation, while popping out all sorts of interesting correlations between people that would seem to be entirely disconnected.

Once you have ANY sort of collection and mapping mechanism for people relationships for 2 degrees and beyond, the possibilities of further 'relationship intelligence', makes this very early potential of SNS very powerful. The next step is to map in all sorts of information through your extended social network. The types and quality of relationships that may be created and maintained with a little help from bits and bytes may actually help us all put back a bit of quality of life that other forms of automation seek to crush.

Social Networking is an interesting and useful concept and you should at least be thinking about it today and planning how you might wield it. This is not a test, this is real, and will shortly be a part of enterprise systems – also see enterprise-focused companies such as Interface Software, Contact Network Corporation and Visible Path to round out your views. My 638,900+ closest friends on Linked In concur, we'll see you IN the net.

By

Carl

Frappaolo

"Everyday living is too fast, too busy, too complicated. More than at any time in history, it's important to have good information on just about every aspect of life. And, there is more information available than ever before. Too much in fact. There is simply no time for people to gather and absorb the information they need."

Taxonomy

An Eternal Problem.

This quote speaks for a generation. We have experienced first hand the onslaught of infoglut, countless corporate intranets, and the vast resources of the World Wide Web. Virtually everyone reading this quote can empathize. Well, it may shock you to learn that this quote is not attributed to a contemporary, but written generations ago. The quote was first uttered by Britton Hadden, shortly before he founded *Time Magazine* with Henry Luce in 1929.

The experience of difficulties with cataloging and retrieving unstructured information effectively is an eternal problem. Not only has it been a pressing issue for generations, there is also evidence to believe that we will always seek better, more efficient approaches toward the ultimate goal of perfect recall and keen precision.

Over the last decade, the software industry that has set content creation and distribution on steroids has also attempted to keep pace with new automated approaches to categorization and retrieval, that leverage the speed and efficiency of the electronic information infrastructure.

In a recent survey conducted by Delphi Research with over 300 companies, 59% of respondents indicated that locating and accessing the information needed to do their job has gotten simpler and more effective over the last 2 years. Yet, 68% went on to state that retrieval is still difficult and time consuming, with 62% expressing dissatisfaction with overall information retrieval efficiency.

(The full findings of this Delphi Research are presented and analyzed in the section *Taxonomy & Classification Market Analysis* beginning on pg. 16 of the 2004 Delphi Report on this topic.

Defining Taxonomy and Classification

The creation of an information architecture, which may include a taxonomy, an ontology, search, and/or classification is often complicated by confusion over these elements themselves. It is therefore important to start with definitions of these functions.

Taxonomy – is a hierarchal or polyhierarchical listing of topics or subject categories. It may not include a definition of the topics, but only the hierarchical relationship of topics to one another. A taxonomy can incorporate content from both a thesaurus and an ontology. There are no standard file formats or approaches to taxonomy construction. A taxonomy is often used to provide a structured navigational path through a content collection.

Thesaurus – is a network of words and word meanings and relationships used to put conceptual definitions into context. It defines a lexicon and the relationships between words in that lexicon. A thesaurus may be a precursor to a taxonomy, in which the leading or preferred terms in a thesaurus are used to define the taxonomy structure. Thesaurus construction is defined by ANSI standard Z39.19. A thesaurus is often used to enhance the intelligence of a taxonomy and/or search tool by providing insight into word meanings and relationships.

Ontology – is a network of relationships that are self-describing and used to track how items or words relate to one another. For example, a "lives at" link or "works for" link in an ontology would be used to track these types of relationships and their corresponding values for listed individuals. Ontology is the framework of the semantic web, and permits intelligent navigation.

Classification – is the process of analyzing content and determining where in a taxonomy it belongs. The classification process typically results in the assignment of metadata tags. For example, the assigning of a Dewey decimal code to a book, based on the mapping of its content into the dewey decimal system is a form of classification.

Toward an Information Architecture

Software that enhances the performance of search engines, text mining, ontology, summarization, content classification and taxonomy construction has had dramatic impact on lessening the burden of the knowledge worker, but the perfect solution is still not within our grasp. Part of the user dissatisfaction stems from information management solutions in organizations that have developed organically over a period of years. Most organizations do not have a centralized, strategically developed information architecture. Under such an architecture, multiple layers of information management functionality are orchestrated and coordinated as a service, capable of being deployed against any number of content sources and repositories. A well defined information architecture is the antithesis of approaches that link search and management to individual repositories, causing user frustration with jumping from one research environment to another. In the recent Delphi Research survey, 82% of respondents reported that they do not have access to a centralized single point of search and management across information sources.

A well thought out, orchestrated approach to content tracking, categorization, search, and retrieval can give the illusion of content integration. Though perhaps not the only or most efficient manner in every case, the provision of a singular navigational front end (e.g. taxonomy) and omnipresent search tool that collectively aggregate disparate content resources, can, from an end-user perspective, deliver the simple single point of access that many users strive for.

But therein lies the challenge to the business and IT communities. While the business side must determine the right levels of functionality needed, IT must develop approaches that simplify the delivery of such functionality and minimize the number of front-ends. Understanding myriad sources of unstructured content (e.g. web content, e-mail and on-line files), requires the orchestration and coordination of multiple disciplines and technologies working in concert. This is the result of a well planned information architecture.

Pivotal points in any such information

architecture are the selection and implementation of taxonomy tools, categorization tools, and search tools, each ranked as critical to a information architecture by a plurality of research survey respondents.

Why Taxonomy

While we will revisit the definition of these functional components and their relationships, we have to first ask a more basic question: "Why the current interest in taxonomy in many business organizations?"

As previously stated, Delphi Group's research on user experiences with using content reveals that lack of organization of information is in fact the number one problem in information management and retrieval, in the opinion of business professionals. These professionals include customer service representatives, the sales team, the financial services professionals, the R&D engineers and senior executives. If these professionals are spending 20% of their time or more looking for information (as our survey results indicate), then this results in an opportunity cost and represents a runaway expense item in many organizations.

One of the defining challenges of this era of enterprise computing is just this: How do we find the relevant and pertinent information to do our jobs and make informed business decisions? The answer is at once obvious and elusive. We must harness the computer to help manage and retrieve content at the same rate at which it allows us to create and distribute that content.

Intelligent Information Processing

Why is it so difficult to effectively mine answers from unstructured content? To illustrate the answer to this question, lets use the example of searching for information about chips. A search on the Web for "chips" (using the Google search engine) returns 2,430,000 references. Even if only 1% of these documents were relevant, that is over 24,000 documents, which is far beyond the capability of most of us to wade through. Some of the documents contain information about – chocolate chips, potato chips, buffalo chips, wood chips, poker chips, an old TV series (ChiPS), or integrated circuits. "Chips" , like so many words can have multiple meanings, and become difficult to define when taken out of context. This example is easily applied across research environments. Most words and phrases can have multiple meanings – consider this short list: "java," "can," "branches," and "boot."

People can distinguish the specific meaning of a word or concepts based on the context the word is used in, but, computers cannot. Other methods must be used by computers to provide information intelligence (e.g. for precision in retrieval.)

Context

People explore concepts; computers (without the aid of sophisticated software) primarily search for key words. Relevancy is subjective to the individual who is performing the search. Only each individual can judge how relevant a particular bit of information is to what they are attempting to discover. The document may be too technical or out of date or too general for your needs. It could be only vicariously related to the subject of research, or completely misaligned. Context is the determining factor. Machines can't distinguish between "John Smith to marry Mary Jones" vs. "Reverend Billy Graham to marry Bruce Springsteen." Only individuals who can interpret text in the proper context can understand that Reverend Billy Graham will perform the ceremony and not be the recipient of Bruce's ardor.

Consider again the example of searching on "chips." The search may have been intended to focus on integrated circuit "chips" and not a recipe to make chocolate "chip" cookies. If you had only searched in a category such as computers or electronics, you would have found fewer documents, more precise and relevant information. If you have categories and hierarchical structures of information you will be able to narrow the search field and find relevant information faster.

Ambiguity

The beauty of language is that it has many words to describe the same thing. The corollary is that the

same word may have different meanings. "Chips" is one example of an ambiguous word. "Java" is another. Java could be an island, a cup of coffee or a computer programming language. "Kick the bucket" is another phrase that could have multiple meanings depending on the context. Consider the sentence, "Joe kicked the bucket and the water spilled out." The question is: did Joe die? or did Joe violently place his foot in contact with a container of water? The context of the surrounding phrases in the document will clarify this. So the question becomes, how do you automate or simplify the categorization and classification of documents that are made up of richly ambiguous words and phrases?

Browsing vs. Searching

Effective search of content without benefit of a taxonomy requires that you know the words and phrases to use before you see what is in the collection of documents. Key word search assumes you know what you are looking for and that is often an erroneous assumption. Knowledge workers are not always exactly sure what they are looking for but, "when they see it, they know what it is." More than 20% of the day is involved in searching for information on the knowledge worker's computer system. About 70% of that time is spent browsing for information. 75% of the people surveyed during a Yahoo market research project preferred browsing to searching.

From our previous example about "chips," you may not have known there were many types of computer "chips," such as processor "chips," application specific (ASIC) "chips" or memory "chips." If there were categories of computer "chips" such as: processor, ASIC, and memory "chips"; you may find all the information you need is about flash memory "chips." In some instances, it is easier to discover information about a particular subject if you see it in the context of related information. Browsing encourages associative thought. Browsing in categories can guide you through the information discovery process.

Browsing is not superior to search, in reality they compliment each other, and should be used interchangably, based on the type of retrieval that is required in each situation.

People search for information in two basic and different ways – ***searching/locating*** and ***browsing/discovery***. The first is the process used when you know what you are looking for. You know the answer, now you need to find more information about the subject. Keyword search with Boolean logic and traditional search engines are good for this type of approach. The application of thesauri and other concept-based tools and approaches to word search enhance this process. Using our previous example of "chips," the query could have been constructed on a full phrase such as "chocolate chips," or, quite differently, "computer chips." This approach to concept-based search would render more precise results. But ultimately, such approaches to retrieval of content do assume that the user has some knowledge of the subject and can formulate an effective query string. These scenarios are more about search and location and less about navigation and discovery.

A Sample Categorization Technology Hierarchy

- Categorization Approaches
  - ***Manual***
    - Advantages
      - Human judgment
      - High accuracy
      - Disambiguation
      - ...
    - Disadvantages
      - Labor intensive
      - Inability to scale
      - Expensive resources
      - ...
  - ***Automatic***
    - Advantages
      - Handles huge volumes
      - Scales easily
      - Inexpensive resources
      - ...
    - Disadvantages
      - Rule/algorith fragility
      - Inaccuracies
      - Difficult to train
      - ...
  - ***Hybrid***
    - Advantages
      - High volume + accuracy
      - Human-guided rule sets
      - Incremental learning
      - ...
    - Disadvantages
      - Management challenge
      - Special skills needed
      - Maintenance effort required
      - ...

Browsing, the second basic approach to finding content is more focused on discovery. In these instances, often the user does not know the answer they are looking for when they begin the search for information.

Let's use the example of doing research on categorization technologies. In the sidebar at left, we provide an example of a possible hierarchy for information about categorization technologies.

The availability of this taxonomy provides the researcher with great insight into the

subject. The availability of this taxonomy eliminates the need for the researcher to completed understand the subject before issuing a query. It serves as a guide to the research process – even educates. Using this example, the user starting this search process can immediately realize that there are several alternative approaches to categorization. Further research could delve into the manual approaches, for example, or focus on the alternatives, an automated or hybrid approach. Further investigation of the taxonomy reveals – before a single question is posed, that there are both pros and cons to using a each of the approaches. The taxonomy allows browsing of these issues immediately, progressively revealing areas of interest to the researcher.

Methodologies used in the automatic process of categorization may not have been understood by the researcher initially. But the tracking of these by the taxonomy, makes them immediately discoverable by the researcher. By learning more about the various methods of automatic categorization (i.e., rules, example learning, semantic analysis and clustering analysis) you can better understand how each of the methodologies may be applied to your particular situation.

Visual, hierarchical arrangements of subject categorization trigger associations and relationships that are not obvious when initially searching in most instances. This distinction is important and implies yet another reason why categorization can be critically important to the productivity of knowledge workers.

The point is that when this research was initiated, the researcher was not thinking about cost-justifying a software solution, nor were you aware of the various methodological approaches to the problem. This information was discovered without an time-consuming query/search/re-query process, but rather immediately discovered within the structure of the taxonomy. Browsing via a taxonomy in essence provides an education on the subject and lends insight into the issues or facets of the subject.

Visual, hierarchical arrangements of subject categorization trigger associations and relationships that are not obvious when initially searching in most instances. This distinction is important and implies yet another reason why categorization can be critically important to the productivity of knowledge workers. With the advent of web sites and portals, the usefulness of taxonomies has become even more powerful and popular. The taxonomy can expose the inner structure of a site or portal. It allows the user (e.g. a customer to a retail web site) to learn about or appreciate the content of the site. It provides an immediate education on the content and functions available on the site, and can guide the user through the site. This can be critical to the successful experience of a first-time visitor to the site.

An intrinsic benefit of the hierarchical structure of categorization is that links and summaries of information are rendered in the context of their unique "parent-child" relationships. Relevant information is more likely to be found when specific content foci are employed. Browsing the taxonomy provides this benefit in three distinct settings – dynamic, interactive/iterative and educational.

Browsing is dynamic. Information changes all the time. Virtually any search on a complex topic becomes a hunt for a moving target. In today's business environments, information can change daily, weekly, monthly – or without warning. Changes to existing content are made, new content is added, dated content deleted. Indeed, respondents to the Delphi Research survey indicated that the number one source of frustration with search of on-line content is the fact that the content they search for is constantly changing, which both frustrates the user and reduces the effectiveness of simple search. Use of a taxonomy can provide a dynamic bookmark so to speak, a one-stop-shopping guide to all relevant content on a subject. Return to a subject node exposes the latest and complete collection of content about that subject area – each time the node is opened. This is a most powerful application of taxonomy, as it addresses what survey respondents cited as the number one cause of research frustration, the dynamic, volatile nature of information sources.

Browsing is also an interactive process. Navigation of a well-designed interface to information on a web site/portal automatically directs the researcher to other relevant topics. A search and browse through information about categorization software, for example, will uncover reviews, analysis, white papers and commentaries with information about other technologies, companies or related

Navigation of a well-designed interface to information on a web site/portal, automatically directs the researcher to other relevant topics. Information architects can identify the major FACETS (subject matter areas) of a site and construct unique taxonomies or classifications to serve as navigation guides for each facet.

topics of information that may be worth investigating. In fact, if taxonomies were built on each facet of a site (e.g. one on subject matters the other on services and resources), the linking of the taxonomies in a matrix could provide cross selling or expanded education. For example, a user who discovers communities of practice regarding automated taxonomy tools via an initial investigation into these tools, could be exposed to and linked to other communities of practice available at this site on other related matters.

Browsing can also be an iterative and educational process. Repeating the process refines the focus while deepening the knowledge. Accessing relevant information and interrelated ideas and concepts supports a fundamental change in user focus and activity – from simply searching, to finding and discovering.

Towards an Integrated Information Architecture – Taxonomy and Search

Whether using navigation for discovery, research, education or using search for targeted retrieval, business users turn to search and taxonomy to find relevant information quickly and intuitively, to support better informed and hence more effective decisions and actions. Equipping enterprise knowledge workers with the tools to make smarter decisions is a strategic imperative in today's economy. Jakob Nielsen, the guru of usability, estimates that poor classification costs a 10,000 user organization $10M annually.

To this end solution design needs to consider multiple ways of providing a taxonomy, and integrating it with search functionality. In so doing, multiple research environments can be supported.

Front-end, Back-end, To What End?

Jakob Nielsen, the guru of usability, estimates that poor classification costs a 10,000 user organization $10M annually.

Maximum return on the investment of building a taxonomy does not come from viewing it as a stand-alone tool, but as a integrated strategically leveraged module of an integrated information architecture. Taxonomies can and should be integrated with other applications. New approaches to integrating taxonomies with search functions can provide high leverage and innovative features in these architecture projects.

In the most basic approach, a taxonomy can exist side-by-side, stand-alone to a search tool as a separate investigative alternative. The search tool provides content-based targeted search, the taxonomy a navigation path of discovery. Each function exists as an alternative to the user to support distinct approaches to research. It should be noted, however, that even in this "separate but equal" approach, taxonomy technology, and related thesaurus technology can be leveraged by the search engine to provide more accurate search results. The ability for search engines to search not just on keywords, but also on implied concepts and ideas can be implemented through the integration of lexical and linguistic techniques and knowhow captured in a thesaurus and or taxonomy.

The taxonomy can also be leveraged as a front-end to search. A user who is somewhat naive about an overall subject area and its many facets might begin the research process by navigating through a taxonomy. When a particular node of interest is discovered, a subsequent search could be executed – this time against only the content in this particular node of the taxonomy – to drill down and locate sources which contain occurrences of specific words, phrases and/or concepts. In this manner, a broad search is narrowed (precision increased) by discovering sub-topics of focus through the taxonomy. Once embedded in this area, search is used to further refine the investigation to a particular issue.

Conversely, a taxonomy could be integrated with a search tool as a back-end interface. Here the user might start with a broad-based word

search. The results of the search would not be a uninformative listing of thousands of "relevant" sources. Through integration of a taxonomy, the results of the query could be displayed as a customized set of folders (derived from a taxonomy or a dynamic classification), which organize the content by related subtopics. This dynamically organized presentation interface – based on the integration of search and classification – provides the researcher with further insight regarding how the topic of focus is broken down into subtopics.

The Challenge of Taxonomy Design and Construction

The application of taxonomy as a means to organize business content is a complex issue. Since we are talking about semantics and language here, there is an inherent problem with using the word taxonomy to describe this type of technology. When applied to business content, as opposed to scientific classification, taxonomy is a conceptual organizational structure. Unlike the categorizing of life forms, categorizing of business documents can and should be ambiguous.

The strategic deployment of a taxonomy in an organization's overall information architecture can provides many enhancements to information work. But at what cost? Taxonomy design and construction is not without a cost in technology resources, and, more important, in skilled human resources needed to develop the practice.

The concept of taxonomy evolved from the life sciences. In the scientific community, taxonomies were conceived as a way to organize and categorize life forms into a structured and controlled hierarchy. In this approach, a plant or animal is placed in a single spot describing its hierarchical relationship to other plants and animals.

The application of taxonomy as a means to organize business content is a much more complex issue. Since we are talking about semantics and language here, there is an inherent problem with using the word taxonomy to describe this type of technology. When applied to business content, as opposed to scientific classification, taxonomy is a conceptual organizational structure. Unlike the categorizing of life forms, categorizing business documents can and should be ambiguous. A document could and perhaps should be placed in multiple categories depending on the business context and the task environment or expertise of the user. This added level of classification complexity in the business setting makes the design and construction of taxonomy structures all the more challenging.

The need to categorize or position content sources (e.g. documents, application data, rich media, etc.) into the resulting taxonomy requires careful, deliberate classification of each source. The assignment of metadata tags, for example, that enhance each content object and suggest "latching" the content to specific subject categories and taxonomy structures. The tagging effort represents another process that a business must undertake in order to obtain the benefits of a taxonomy. In some cases, this could be done manually. But this approach is not easily scalable. The speed of the classification is limited by the skills and number of individuals assigned to this classification task. Additionally, who within the organization will take on this role is an issue. Will authors (e.g. researchers, scientists, lawyers, doctors, senior management) be willing or available to perform this classification manually? Will a separate staff of content classification specialists need to be defined and trained?

Addressing these issues of taxonomy definition, construction and classification must have a dual focus:

- identify business requirements and trends
- understand and evaluate available technology alternatives.

To shed light on current business practice in the area of taxonomy, we turn now to the results of the Delphi Research 2004 survey on user experience with search and taxonomy technologies and practices.

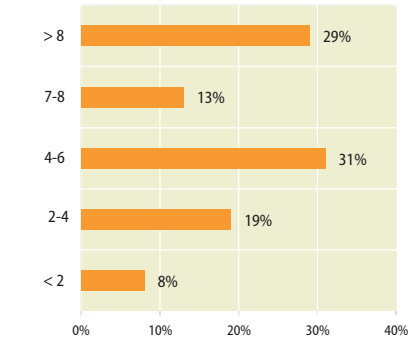
The Quality of and the Reality of Search Habits

Imposing the element of time into the analysis sheds greater light on the magnitude of this issue. Business users spend a significant part of their work day pursuing relevant information. A full 42% of survey

respondents report that 20% of their work week is spent seeking information. Another 31% percent spend between 10%–15% of their time each week looking for content. Clearly there is a business case to be made here regarding how knowledge worker productivity could be enhanced through faster/more effective search and retrieval.

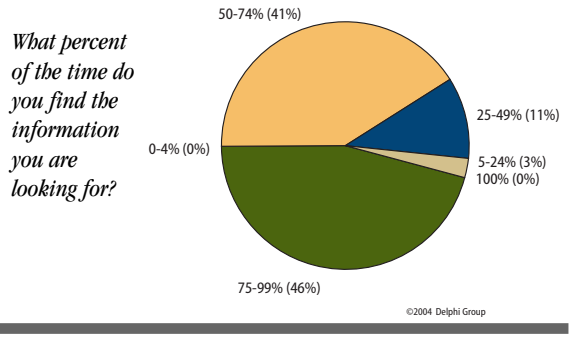
Ultimately the time spent searching and retrieving should be viewed via the return on time invested. In other words, are current efforts yielding valuable results to today's business users? In this regard, the survey responses uncovered another positive trend. While no one reported that they discover what they were looking for 100% of the time, an overwhelming majority of the respondents stated that they are successful more than half the time. Indeed, a full 46% reported success in 75% - 99% of the time. Thus, given enough time and willingness to endure "pain" and frustration, the "right" content is retrieved. This is perhaps one impetus to the respondents' more positive perspective on retrieval over the last two years. This finding points our investigation more towards the speed and ease of use of retrieval environments and less to the effectiveness, as the primary point of pain amongst today's business people. Here issues such as the availability of a taxonomy, its intuitive nature, and accurate relevancy ranking become more critical focal points for an information architecture strategy. Other survey findings that follow support this conclusion.

While most respondents reported finding what they needed most of the time, it is often at the cost of seemingly unnecessary digging – as opposed to efficient finding. Survey respondents indicated that they rarely find what they need on the first page of retrieved content. While this is applicable to relevancy ranking in search, it also bears strong indication for the need for well-constructed taxonomies, or navigable paths to content. Designing and engineering the order or hierarchy into which taxonomies classify content is a core competency for the taxonomy practice.



Hours per week spent searching

How far are users willing to keep searching through layers of content? Whether traversing a taxonomy to navigate a site, or in response to a query, or in organizing query results users exhibit a tolerance threshold. For years, we have purported a general rule of thumb in taxonomy design – the 10 x 4 rule. The premise is that good taxonomy design will never present more than 10 topics (choices) at any single level of the taxonomy, and that no path should navigate further than 4 levels. While generally accepted amongst many designers of taxonomies and web sites, these guidelines appear to resonate with surveyed respondents as well. Among respondents, the greatest number of them (68%) indicated a tolerance level for navigation of 3-4 levels. This speaks loud and clear, a well designed/useful business taxonomy should not provide more than 4 levels typically because user will not go beyond that. This can be a challenge for highly detailed and content-rich collections or web properties. Understanding the tolerance of the user or customer communities become key to a successful presentation or interface design.

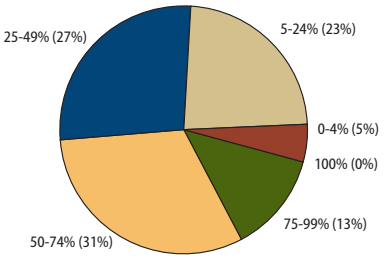


What percent of the time do you find the information you are looking for?

As taxonomy and classification technology mature and become more visible, as portals move into their second and third generation deployments in organizations, as web sites become more even popular vehicles for e-business, the role of taxonomy to the basic business strategy grows in importance. In this respect, we see a marked change from opinion two years ago. In 2002, 7% of survey respondents saw taxonomy as imperative to their business strategy. 2004

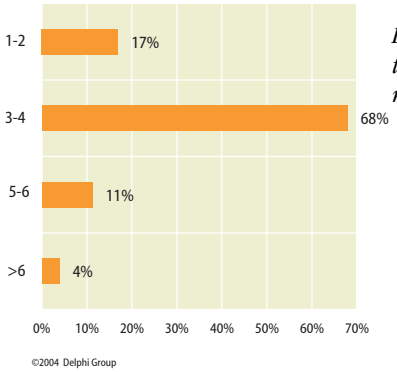
respondents increased this opinion by 4 percentage points (11% ranked taxonomy as imperative to the business strategy), nearly a 60% increase from the earlier survey.

What percent of the time do you find the information you are looking for on the first page of suggested search results?



The largest gain in user opinion however, came from those that rank the importance of taxonomy to the business strategy as very important. Whereas in 2002, 19% of respondents ranked taxonomy as "very important," 29% of respondents in 2004 ranked taxonomy as very important to business strategy (a gain of 10 percentage points or a 53% shift in sentiment in this category).

Levels of taxonomy navigated



Far fewer 2004 respondents viewed the taxonomy as only somewhat important to business strategy compared to 2002. But equally significant, those who reported that they simply did not know the importance (understand) the impact of taxonomy dropped from 16% in 2002 to a mere 6% in 2004. Clearly as business professionals get more educated and accustomed to the challenges of e-business, portals, web sites, and the growing complexity of related content, the role of a taxonomy becomes not only more clear, but more critical.

Business and Technology Insight

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