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Real-Time Enterprise

The Ultimate Synergy of Business and Technology

Creating Sustainable Competitive Leadership

Think of it as the "big bang" of business. Where the 1990's might be thought of as the Internet Age, this decade will be known as the Real Time Age. We are at a significant crossroad between what may be the ultimate synergy of business and technology. The quest for real time information processing finally may be within the reach of all companies -- large and small.

A Real Time Enterprise (RTE) is a competitive business strategy that takes advantage of up-to-the-second and accurate information that is available for management, employees, suppliers, partners, and customers. Real time enterprises are highly adaptable. They can respond to changes in the marketplace as well as better predict those changes before they uncontrollably impact the business. A good way to think about an effective RTE is to measure its real control. Real time enterprises know what their customers need and deliver it proactively; they can close their accounting books in hours rather than weeks; and they can minimize the impact of process deviations caused by market changes, or even acts of God.

With the incredible economic pressure to reduce costs and improve productivity, today, more than ever before, companies large and small need to empower their entire organizations to make educated, timely decisions. Whether you consider the real time enterprise a revolution in concept or an evolution in technology, it is hard to argue that right now, every business needs to consider how making their operations work in real time can and will impact their viability.

Generation RTE

In today's connected world, computer literati prefer live chat over e-mail, and subscribe to chip-embellished credit cards to make online shopping even more convenient. Today, it is just as common to find a handheld device in someone's briefcase than perhaps even a pen. Within the last decade, technology has made vast changes in our lives and expectations. Indeed, the last 10 years have tested the notion that patience is a virtue. We have become irreversibly a "zero-latency" culture.

Businesses need to have information on demand

Australia-based Patrick Corporation is, in fact, made up of one hundred different companies. The company, a result of



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Average Efficiencies in Operating a Real Time Enterprise

- 30% Reduction in operating costs
- 23% Reduction in headcount
- 40% Increase revenues
- 35% Improved customer retention
- 37% Decrease in cycles times

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both for their customers and for the employees with whom they interact. They don't want to repeat their names, passwords, or other verification information to multiple company systems or people. Consumers will quickly go elsewhere if a company doesn't have the necessary information

successful acquisitions, is now an \$800 million corporation that includes businesses that handle stevedoring, cargo transport, railways, auto transport, warehousing, and other port-related transport activities. Patrick Corporation selected PeopleSoft's 8 system to enable them to deliver real-time financial and HR information to managers on their desktops. Now, by using the PeopleSoft Enterprise Portal, they can provide information on human capital, financial issues, and asset utilization. Before, they would receive this information on paper only after the month-end processes were completed. As a result, duplication is also eliminated. "We're cutting transactions out," says Patrick's finance director, Robert Dunn. "That means our people can spend their time analyzing information, rather than just processing it." On the finance side, by standardizing common business processes, the corporation achieved world-class efficiencies in critical areas like financial and regulatory reporting. Month-end close times are down by an average 45 percent, with some of Patrick's businesses requiring only two days to close their monthly books.

Source: April 2002 NerveWire Survey of 162 Business and IT Executives

or product at the right moment. And what about investors who have been indelibly stung by the surprises of companies which are supposed to be in control of their operations? Despite advances in communications and automation, companies still do not (often, because they can't) report their financial positions until several weeks after the close of a quarter. Even if CEOs are held accountable for the accuracy of the reports, can they effectively do anything to improve the current position with only the available historical information?

As we look forward in the short-term, it may be mandated by law for all companies to report their financial positions more frequently and closer to real-time.

However, even without legal enforcement, companies that can close their books at the end of each business day will inevitably win investor confidence and subsequent wallet-share. Soon, we'll be surprised to hear a customer service representative say, "Please hold while I access your records" or, "Let me get back to you on that," notes Barton Goldenberg, president of ISM, a company that specializes in real time product evaluations and industry consulting. "Building a real time enterprise is no longer a competitive advantage, but rather a means of survival. If knowledge is power, real time information is the means for creating monopolies."

Information technology (IT) and business strategy have long been evolving toward RTE. We know that having access and the ability to use timely, complete, and accurate information allows for more effective business decisions.

However, like most enterprise-wide initiatives, this is much easier to say than it is to do. RTE depends on a lot of technology, processes and cultural changes. These things must work together to generate, gather, distribute, and use information efficiently and securely. Perhaps, this has always been the IT end game, but now, we're seeing the real possibilities and urgency of businesses to commit themselves to real time initiatives. Peter Fingar, noted author and expert in technology and business said, "When information is recorded, it's history. While information is being created, that's the time it's really useful and actionable."

There are already a handful of successful real time enterprises being highlighted and examined such as Cisco, Fed-Ex, UPS, Dell, eBay and Walmart. Their stories relate how these companies have flourished by improving their inventory management, providing more flexible and responsive customer interfaces, and enabling the entire organization to closely monitor and react to exceptions in their business processes. Like most visionary organizations, these market leaders made huge investments over long periods of time, to create information systems that provide critical and timely information to employees, customers, partners and suppliers. By employing technology in this way, they've created truly impenetrable barriers of entry into their markets by their competitors. One might even question whether their true competitive advantage is due to their product/service or their information systems. With these early adopter experiences and their successes in reaching operational excellence, other companies are now deploying real time initiatives with great urgency.

Real Time Retailing

Take for example, Sam Goody, a division of Best Buy Enterprises. Sam Goody is a leading home entertainment retailer selling music, movies and home electronics in most malls across the U.S. For many years, the company has been building an inventory management system that enables them to monitor product stock levels in their stores and warehouses. Aside from the rather obvious benefits of ensuring that the necessary product is available for sale at all times (and not too much inventory taking up valuable space), they have built a complementary knowledge management system. This allows individual store managers to compare their own successes with that of their peers across the company's other 840 stores. With critical sales periods tied to timerestricted events like a new music release or a holiday, the windows of opportunity are small and can make or break the profitability of an individual store. The system can also instantly alert all personnel about competitive threats, such as the competition's latest sales and ads.

Stephen Brobst and Todd Walter, both CTOs at Teradata, a company specializing in creating active data warehouses, expressed that "the most critical aspect of implementing a real time enterprise is creating a single source of the truth -- that is, bringing all the corporate data into one place where it can be delivered appropriately to the people who need it, when they need it." By using an active data warehouse from Teradata, Union Bank of Norway (UBN) has been able to drive its customer relationship management strategy around eventbased marketing. Event-based marketing is built on the simple idea that the best time to market to a customer is when the customer shows a need or interest. So, for example, when a customer places large deposits in his or her account, the time is right for some individualized follow-up for additional savings or investment products. In the initial pilot program, UBN obtained a 60 percent conversion rate running event-based campaigns. They also believe that the solution will help cut costs because of more automated processes and the ability to use multiple channels in their marketing approach.

Reactions to the event-based marketing initiative from both UBN's customers and sales force have been positive. Sales have improved and the bank has cut timeto- market for its new customer-communication products.

required. They ran several pilot programs before rolling out the program company-wide. The benefits, however, have far outweighed the challenges. The company is now realizing better inventory turn, higher employee and store productivity, and higher profit margins due to smarter selling and more responsive marketing. The bottom line has been the industry-leading success it has enjoyed in terms of sales and stock price.

Transforming Industries in Real Time

Clearly, the key benefit of real time is the ability to make faster and better decisions, since information is more accessible. For example, the ability to automatically replenish inventories when they are found to be low, to alert managers to shift sales strategies to those that are working and away from those that are not, or to quickly identify and efficiently fix a process that has gone awry.

The tenets of an already established business/technology solution, Supply Chain Management (SCM), created a solid foundation for understanding how information about the relationships throughout a product lifecycle can dramatically affect the costs and profits of an organization. However, developing real time systems can, in fact, enable much more than that. As noted with Sam Goody, real time systems can enable collaboration that, in and of itself is invaluable, when the people and knowledge are distributed across various locations.

Real time can also enable innovation. For example, eSuds, a division of USA Technologies, re-outfits laundry machines on college campuses with intelligent computer devices. The machines can send repair messages to the operators, when there is a problem or notify them when

To help maximize these opportunities, store personnel can review, request, and submit selling tips through one of the several in-store systems dedicated to accessing the company's knowledge management Intranet. With these systems, local managers can quickly identify stores that are leading in sales on specific products or programs and then use them as showcases to help those stores that are not doing as well. This allows the Sam Goody stores to share best practices and apply them quickly and effectively.

"If we have target products or programs that we are incenting our staff to focus on, having the ability to monitor progress minute to minute allows us to make adjustments as needed," concluded Ted Jirele, program manager for The Knowledge Management Group at Best Buy Company. "By providing front line managers and store staff with timely product and sales information, they can more effectively sell the right products and troubleshoot problems, while they can still make positive changes."

However, establishing real time hasn't come quickly or easily to the company. They have spent enormous amounts of time and money to build the technical infrastructure, operational processes and people skills needed to develop and use the information

maintenance is due. Since a broken machine ceases to generate any money, getting a machine back online quickly is imperative. Additionally, students can view the availability of machines from their dorm rooms using an Internet browser to a dedicated Web site for that laundry facility. The system will also send e-mail notification to the student when the laundry is completed.

Detergent and softeners can be automatically dispensed for an additional fee, and best of all, the machines can operate in a complete cashless mode by using student ID or "Mobil Speedpass"- like devices. Not only is this system more convenient for the students, the operators no longer deal with the high theft rates of money being stolen from the machines. Individual and aggregated data stored about the students and their laundry habits provide invaluable information to help plan and alter the laundry facilities, to accommodate demand and overall usage patterns. In this example, the use of real time is, in fact, transforming the way an industry works. Where only seven companies control the vast majority of laundry facilities, doing business in real time can be a critical competitive advantage. eSuds is proving that it can dramatically improve profits, as well as the customer experience and subsequent loyalty.

Is it Really Time for Real Time?

RTE is coming of age at a time when confidence in business and management is at an all time low. People, specifically recovering investors, are demanding proof of both management's operational control of the business and their reliable predictions of future performance. These requirements are driving organizations to implement new systems and measurements, often as a means of survival.

Most analysts will agree that the ability of an organization to be a real time enterprise has required an evolution of technology that has matured over time. Some argue that RT is enabled by the generation of PC literate workers and consumers who are "justifiably impatient."

Bob Blumstein of research and consultancy firm IDC asserts, "Real time computing is as much about human psychology as it is about computing." Blumstein continues, "While there are the challenges today in helping people to know what to do with immediate information, the next class of business school grads will expect it."

Business schools have always taught the value of making timely, accurate decisions but rarely cited the inability of real-world managers to do this, because of limitations in IT. Often, people cite their biggest challenge in making fast and accurate decisions is having information stored in disparate systems all over the enterprise.

However, data is only part of the overall real time puzzle. "Application integration remains one of the toughest challenges in today's IT environment," commented George Schussel, chairman and founder of DCI, a leader in hightechnology education, trade shows, and management consulting. "On average, businesses have over 49 independent applications that need to be integrated, and they expect to spend over one third of their IT budget each year to do this."

An entire industry focuses on application integration. Integration projects make up a critical share of revenues at such consulting groups as Perot Systems, Accenture, DWL, and IBM Global Services.

Application integration isn't a new problem, and there have been many major technology innovations that have tried to address it. By and large, these technologies were too proprietary and complex to be accepted industrywide. Now, however, new vendor-neutral software standards are being accepted, which will allow application components built and running on different platforms, and performing different tasks, to more easily inter-operate. The new standards are aimed at building software components that are aptly called "Web services."

Like stereo components, the compatibility enabled by Web services allows software components to be interchangeable. Built on the Internet foundation, Web services are the result of several new programming standards, such as SOAP, XML, J2EE, and .net. Software developers can build new systems using these standards and, in fact, "wrap" older, legacy systems, augmenting them with these standard interfaces so they can communicate with newer components.

While software today is usually written in functional modules, the individual modules or components communicate between each other largely using proprietary protocols. Web services provide a standard method of communication between these components that then allows the software components to share data and services without special translation. The goal is to be able to link internal and external online and offline processes, on-the-fly or in real time -- in effect creating an automated software assembly environment in which systems are built and adapted as needed. This brings tremendous freedom to easily build and adapt IT systems that will allow businesses to be much more responsive to changes in their markets.

New software applications are also increasing the viability of implementing a real time

enterprise:

- Management dashboards or cockpits are software programs like those in a car or plane, which present critical information in familiar formats that allow managers a hands-on way to diagnose and deal with business issues, as they are happening.
- Automated alerts can be sent to inform managers of deviations on threshold tolerances, or unexpected process exceptions.
- Packaged analytics software now being used goes beyond the traditional retailer needs to understand consumer behavior, to helping segment customers into appropriate catalog mailings or campaigns.

Working together, Hyperion Solutions Corporation and iSpheres provide a way for all decision makers throughout the organization to utilize real time information. Using iSpheres, employees can create alerts when user-defined thresholds are exceeded. For example, a person responsible for monitoring expense control might want to know when actual spending deviates more than 10 percent. Process control managers might want to be alerted when inventories exceed 5 percent of expected levels. iSpheres continuously monitors these rules and notifies the individual the second the threshold is reached, allowing them to respond immediately. Once discovered, the users can then use the Hyperion tools to further diagnose the cause and then deal with the exception more efficiently. "Real time is all about reducing the time between when an event occurs and when action is taken in response to that event," stated John Kopcke, Hyperion's chief technology officer. "We are moving from date-based planning to more event-based planning, which allows for much greater agility in a world where the competitive and economic landscape can change at a moment's notice."

Today, these analytics tools, rooted in hardcore statistics, are being used to provide managers in any industry with predictive modeling capabilities to help predict what consumers (or competitors) are likely to do in the future. eSuds, for example, uses analytics to help determine what rules or thresholds should be set for maintaining their machines, by reviewing historical data coming in from all their existing machines. In this way, they can proactively maintain and service the machines to avoid downtime and subsequent loss of business.

- Collaboration is playing a key role in developing real time enterprises. Technologies such as shared Web sessions, live chat, instant messaging, and Webcasting allow distributed workers to collaborate and share best practices, as they are happening. These technologies can also be used to provide on-the-spot communications between customers and companies.

For example, some banks are using collaborative technologies to support customers when they need help using the bank's Web sites for completing online applications, or for researching banking

products. More than just helpful in their intent, these collaborative systems allow people to communicate easily and whenever needed. This ultimately brings untapped synergies to otherwise under-resourced organizations.

- Wireless technologies, including phones and handheld devices (such as Palm Pilots or Blackberry computers) can allow us to review information and receive critical alerts anytime, from anywhere.

Wireless tags, sensors, and even something called smart dust will allow us to monitor and control "virtually" any process -- or as some fear, any people. Consider the idea of little LoJack devices on everything from food, to pets, to children, to manufacturing processing.

Some of this is already happening today. While it will be nice to have your refrigerator automatically order more milk when it finds your current supply low, how eager will we be to have our bosses know where to find us at all times?

Certainly, there is the question of how the current economic climate will affect the commitment or perceived urgency of RTE in the business community.

"In many ways, the economy is fueling the need for RTE in forcing companies to cut back workers and find new ways to automate processes. In doing this, they are looking for ways to improve productivity and streamline decision-making," commented Bruce Richardson, senior vice president of research at AMR Research. "We are being challenged to "decision re-engineer" our businesses so that we can convey a sense of urgency throughout the organization and on out to our trading partners. RTE enables us to do that, and carefully monitor things to ensure that we remain knowledgeable and adaptive in the changing, complex marketplace."

Analysts also note that previous technology trends, such as supply chain management (SCM),

enterprise resource planning (ERP), and customer relationship management (CRM), laid the groundwork to develop both back and front office processes. With the experience gained from these initiatives, organizations are now poised to integrate their own internal processes with those of their external partners and customers.

As part of the technology evolutionary theory, the real time enterprise may simply be a matter of finally having all the technology pieces to deliver the right information, to the right people, the right time.

"Much like the great Internet equalizer, companies deploying real time environments will soon pull away from the pack. Dragging behind them will the vendors and competitors who missed the bandwagon. There's over \$1 billion in venture capital money being pumped into the RTE market already," noted ISM's Barton Goldenberg. "And in this tough economy, those companies already at the RTE forefront are weathering challenges much better than those who are not."

The Challenge of Building a Real Time Enterprise

There are many challenges to building a real time enterprise, most specifically, identifying which areas of the business need better access to information, and how fast is fast enough.

Like CRM and other enterprise-wide initiatives, we already know that real time implementations must be done in manageable bites that can quickly show a valuable return on investment. Not everything needs to be accessible in real time and it will be different for every business. For example, an obvious candidate for real time implementation would be a doctor, who would benefit greatly by being able to access patient information in real time. But supplying billing information to patients in real time might not be considered as critical.

Pepsi Cola Buffalo Bottling Corporation, one of the nation's top bottlers of Pepsi, sells and distributes Pepsi products in and around the greater Buffalo, New York area. The company's sales team and managers carry Palm m505 handhelds loaded with route accounting software. Orders are entered directly onto the Palm handhelds, using previous customer orders as a starting point. "If your customer typically orders 150 items, being able to call up the previous order and make changes as needed saves a ton of time," said Dan Tantalo Jr., IT manager, Pepsi Cola Buffalo Bottling Corporation. Weekly ad sheets, digital photos, inventory reports and customer contact information are all available, as are Microsoft Excel spreadsheets and Word documents. Manual data entry has been eliminated, and route times have decreased by 1-1/2 hours. Sales reps now have 15 percent more time to service their accounts.

The benefits:

- Productivity gains give sales reps 15 percent more time to service customers
- Out-of-stock inventory reports, updated every 10 minutes, ensure sales reps order available items for customers
- Digital photos of point-of-purchase displays encourage customers to leverage promotional materials, thereby boosting sales
- Mobile access to weekly ad sheets provides on-the-spot information for customers and shortens the sales process
- Elimination of bulky route books, files, and paperwork remove distractions and improve customer interactions

The early adopters of RTE had little to use as a guide, nor proven technology to rely on. They had no choice, but to build proprietary systems in-house and act as their own system integrators. Now, with the confluence of new technologies and communication infrastructures such as Web services, wireless and the Internet, many believe that we can finally support the needs of a real time enterprise affordably, and with reasonable IT resources.

The key to implementing a real time initiative is finding the business areas where faster access to information can make a significant impact on the business objectives. Gartner's Ken McGee noted, "When deciding what systems and information need to be available in real time or not, it is important to evaluate what information is materially relevant. Information is materially relevant when it will change your judgment or course of action, if it's available sooner than it currently is."

Dave Mosby, president of InterWorks Software Inc., a leading consulting company helping organizations define and design real-time implementations stated, "The traditional functional approach to design is focused on what work is to be automated or processes reinvented. Our approach is driven out of the answers to two basic questions posed to our client.

The first question is, "What are the four key questions to which you need answers in order to know whether or not you've had good day?" The second question is, "What are the questions to which you need answers to produce the results for which you're responsible?"

Mosby continued, "When you consider the answers to these questions, you need to ensure that you are considering the value of real time delivery not only to the organization, but even more importantly, to the organization's customers."

But we know change is not always easy.

Real Time, Real Changes

DCI's Schussel believes that the adoption of real time into our businesses will be "as important as oil was to the industrial age." Consulting giant, BearingPoint, Inc.'s Robert Lees, executive advisor, Asia and the Pacific, noted how aggressively many Asian companies are implementing real-time initiatives throughout their businesses. The Japanese introduced the manufacturing paradigm "Just In Time Inventory," which had a sweeping global impact in both technology and business practices. Today, in Asia, we're seeing an urgency to have "Just In Time Information."

Where some Asian countries lagged behind previous technology waves, now, many want to leap way ahead by implementing real time strategies. For example, in China much is written about both the manufacturing and financial services industries utilizing real time principles to help achieve large efficiencies and improve product management. However, the public sector is also a main focus for completely re-implementing solutions to enable faster access to information and better customer service. China, along with some of its neighbor countries are benefiting from a huge influx of new global capital, much of which is helping to fuel a very aggressive real time corporate and governmental movement.

It's clear that the real time enterprise is, indeed, real and happening now. Europe's no-frills commercial airline, EasyJet, does dynamic pricing based on immediate availability and demand -- and they are maintaining a significant edge, and gaining market share over larger, more entrenched rivals.

Nationwide retailer, The Limited, uses early postings of east coast sales data to alter west coast merchandising, taking advantage of the three-hour time difference.

IBM claimed cost savings of more than \$1.5 billion in 2000, with the introduction of its Web-based customer assistance to its U.S. call centers. GE estimates its digitization initiative saved \$1.6 billion in 2001. And the list continues to grow each day companies -- whether forced by law and business conditions, or simply striving to dominate their market niche -- continue to push forward in delivering appropriate real time information.

"Real time is all about having enough time to make an effective decision and act, and where a late decision is a wrong decision," concludes Peter Fingar.

Experts agree we probably won't see the majority of businesses adopting the concept of RTE until 2005, however, all agree that those who are now making the commitment will be much better prepared to face the continued challenges of the shifting economy, future innovations and the changing demands of consumers. Call RTE a wave, a trend, or a strategy but do not mistakenly regard it as just another fad, or marketing buzzword.

RTE is the new way of life and a new way of thinking that soon will become as natural as the Internet or wireless phones. These technologies are all part of the grand scheme to automate our world, so that information will be as available and useful as water. Whether we'll see the impact of real time enterprises reaching cold fusion proportions, we can be sure that the Real Time Age will at least change the way we think, work, and live.

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