



BPM2002

Market Milestone Report

Contents

Methodology	1
Overview	1-3
The Opportunity Ahead	3-6
Approaching the Market	6-8
A Look at BPM Software	8-9
Web Services: A Growing Mandate for BPM	9-14
BPM Summary Reports:	
FileNET	14-16
Fuego	17-19
Fujitsu	20-22
BizFlow	23-25
HP	26-28
Optika	29-31
Q-Link	32-33
Peregrine	34-36
Staffware	37-39
Sterling Commerce	40-45
Ultimus	45-47

Methodology

Delphi's Market Milestone Reports combine research conducted with both technology vendors and end-users. The resulting report is a comprehensive view of technology sectors, including spending habits, growth areas, customer needs, and vendor solutions.

With consulting practices that address both vendors and end-users, Delphi has a unique view of the business of technology. In doing developing Market Milestone Reports, Delphi conducts distinct forms of research:

- End-user survey—questions distributed to nearly 10,000 individuals ; over 20 industries, located on nearly every continent, are represented in the responses; individual respondents are typically executive and IT management.
- Vendor interview—comprehensive product overview and demonstrations followed by Q&A by Delphi analysts.
- Customer interview/use-case—discussion of products and initiatives with end-users of the vendors involved in the study or an in-depth use-case scenario.

Overview

The only true “killer app” is that which provides greater value from existing software assets. The scrutiny of IT buyers centers on the investments that will cut out the fat, speed their processes, and allow them to do more with less.

This means the ability to collapse the business process by capturing and dynamically managing business logic with integrated application services. Every organization is looking for optimal leverage of IT resources, how to connect business processes with business partners, and how to integrate process knowledge within the business desktop.

It's no surprise, then, that Business Process Management (BPM) is quickly emerging as the moniker for the next Killer App in enterprise software. Few areas of software will receive more attention in the coming months and years than BPM. Yet the greatest challenges to the BPM market are the very forces making it so attractive.

In order to understand the market, it is imperative to know the purpose of BPM. BPM software enables the design, analysis, optimization, and automation of business processes. It does this by separating the process logic from the applications that run them; managing relationships among process participants;

integrating internal and external process resources; and monitoring process performance.

On the Cusp of a Revolution

Delphi research on the subject of Business Process Management (BPM) and Web Services leads us to predict that the next few years will be exciting ones for technology evolution. There is an important juxtaposition of company plans for BPM and Web Services versus thoughts on how the market will play out. What is clear, though, is that the evolution is happening as we speak—BPM and Web Services are taking off now.

A Market Well On Its Way

That 12% of respondents are using BPM software today is consistent with a market in its earliest stage. But with 55% of surveyed companies reporting that they are actively evaluating BPM packages, the market is evolving now. Early adopters have already leapt, and the early majority is ready to spring—of those in the early stages of evaluation, approximately 63% plan to deploy a solution within the next 7-12 months and virtually all of the rest plan to deploy within 2-3 years. Thus, the market for BPM solutions is now. These numbers point to 2002 as a pivotal year for BPM.

The Market's View of BPM

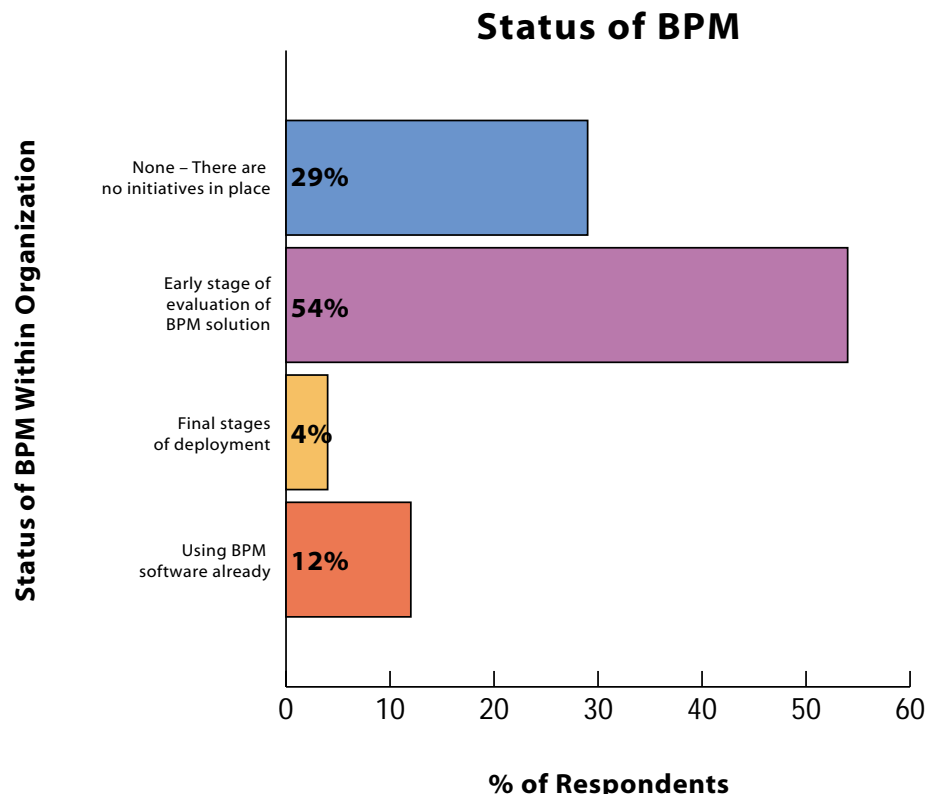
When asked to pick a definition for BPM software, 19% of companies surveyed were either indifferent or unable. This indicates that the supply side of the market continues to face a learning curve in selling BPM as a concept; yet that greater than 80% of respondents are confident in their definitions shows that this is an issue already top-of-mind. Thus, the challenge is less to promote “why” BPM but rather to clearly articulate the “what” and “how” of this software movement.

A small minority (12%) of respondents take a slightly cynical view that BPM is simply the cosmetic re-branding of previous generations of workflow software. To contrast, the

majority of respondents (54%) already define BPM software as a critical element of IT infrastructure, used to process-enable both new and existing applications.

The close association of process and applications is not new, but the way that BPM software affects this integration is different than the first-generation workflow solutions offered a decade ago. Then, workflow required point integration between enterprise applications and the workflow solution. Developers had to hard-code the integration between individual applications. Integrations of this type were often out-of-date the minute they were deployed and typically resulted in broken connections.

To combat the inefficiencies of hard coded, individual integrations, enterprise application integration (EAI) products emerged. These provided an infrastructure for application integration and were scalable for enterprise use. However, first generation EAI products did not typically include BPM capability and employed proprietary architectures for messaging, application adapters, scripting languages, and rudimentary workflow. These products were also focused on integrating back-office applications and not inter-enterprise processes.



In the late 1990's a new class of Internet B2B "gateway" products emerged to exploit the emerging build-out of the Internet. These products began to employ low-level Internet technologies such as HTTP and XML to automate cross-enterprise application integration. Standards development was in its infancy, however these products still implemented application interfaces and response-request messaging protocols in a proprietary way. Similar to the first-generation EAI products, the first Internet B2B gateway servers lacked a comprehensive BPM capability.

Many of today's generation of BPM and EAI solutions facilitate integration through Message Oriented Middleware (also known as "MOM")—a technology that has been around since first-generation EAI products. MOM leverages third-party message queuing servers such as those from IBM or Microsoft or Java Messaging Services available within the J2EE platform. Messaging services offer scalable integration capabilities ideally suited for managing high-volumes of transactions and geographically distributed infrastructure. This level of functionality, however, does not come without a price. Proprietary message-oriented middleware can be expensive to deploy and maintain. And by itself, MOM lacks BPM capability and critical integration functionality, such as translation.

Over the past two years, EAI, MOM, and B2B integration vendors have gradually added BPM to their product sets, and the industry has witnessed considerable consolidation. Today, BPM is really the cornerstone of a next-generation enterprise integration platform software that encompasses a broad and deep set of functionality: sophisticated EDI and XML translation; Internet transport and security technologies; application adapters; and messaging built on JMS and business protocols such as ebXML and the RosettaNet RNIF. Web Services is the newest addition to this mix and promises to continue the evolution towards lower cost, easier-to-use standards-based integration tools and interfaces.

A New Platform for Process Redesign

While BPM has a direct impact on the management and leverage of other software applications, it is not by nature a departmental or application-specific phenomenon. Rather, the top priority for most organizations implementing BPM software today (38% of respondents) is to redesign their processes around the computing platform comprised of the Internet and, increasingly, Web Services. This group will start with

internal processes, but another 7% of respondents said they will concentrate on inter-enterprise processes and the enforcement of their associated rules.

Other internal priorities for BPM deployments are "data-level application integration" (19% of respondents) and "rules-based routing of documents" (14% of respondents). The former underscores the close relationship between BPM and Web Services, which survey respondents also intend to leverage for enterprise application integration. The rules- and event-based routing of documents can also be delivered as a Web Service, either by a BPM application or as native functionality within a content management application.

It is important to contrast the priorities for BPM with what users are hoping to achieve from it. In order of priority, respondents cite first the "automation of repetitive tasks" for the purpose of "accelerating process cycle times." This benefit was cited more than any other, as the top priority for a third of organizations surveyed. Second on the list is "manage and monitor the performance of processes and related tasks and personnel" (25% of respondents). Third, they seek the ability of business (non-technical) personnel to change the business rules and logic of enterprise software.

The Opportunity Ahead

There is ample opportunity for BPM to significantly effect operations within today's enterprise. Of companies surveyed, very few (only 2.5% of all respondents) have most or all enterprise processes codified into a digital form. Yet what is notable is that more than half of the companies in the survey (62%) have currently digitized less than 25% of their processes. These organizations have much ground to cover and will look to BPM solutions to redesign and automate their processes over the next few years.

The vendors which today comprise the BPM market address needs that are critical for enterprises today. As the research shows, the market is happening now, with respondents indicating that a majority of BPM initiatives will take place within three years. That means that vendors have a limited timeframe to make a name for themselves and to prove that they solve customers' process problems. Importantly, the research shows that the BPM market is not shadowing the application server market—that is, there is not a case of vendor lockout. While the application server market is dominated largely by BEA, IBM, and Sun, the BPM

market features many players. Within the market, smaller enterprises are obviously looking for the best-price vendor; large enterprises are open to working with the vendor that offers the best all around deal in terms of both price and performance.

Spending Patterns

Of the roughly 200 organizations surveyed, a combined total of approximately \$100 million is expected to be spent on BPM software (independent of all other software and services) over the next 3 years. Half of all respondents plan to spend in excess of \$100,000, and the majority of this group will budget between \$100,000 and \$500,000. A small minority (5%) envisions spending more than \$5 million on large-scale BPM efforts, with a larger group (about 17%) planning on spending between \$1 million and \$5 million. These latter groups represent the furthest along in their BPM strategies, with more realistic expectations on project sizes. Delphi Group expects that successful BPM initiatives will likely involve at least \$1 million dollar investments for medium-sized enterprises, with larger enterprises spending in excess of \$5 million. Investment plans of less than \$1 million are likely limited to pilot projects. Yet with looking just at the plans in place today, it is not unreasonable

to expect the total market for BPM software to exceed \$5 Billion by 2004.

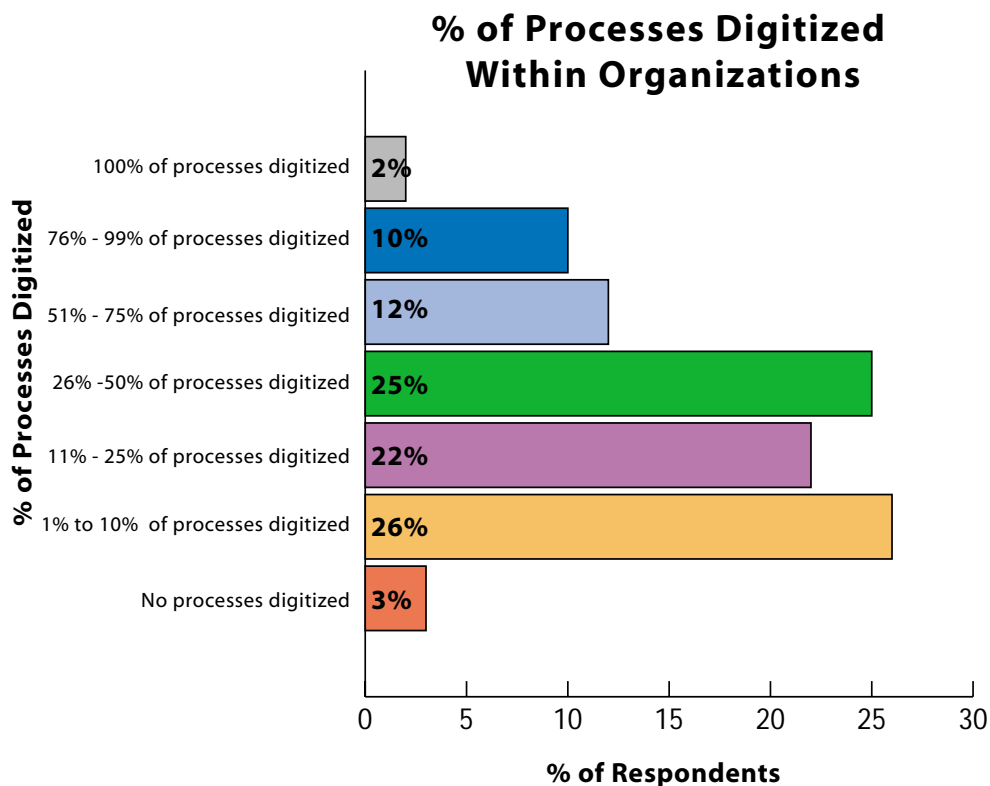
In their estimates, however, organizations may be overlooking one key issue -- the cost of integration. BPM software is integration-intensive by nature, touching many applications and information repositories. While the delivery of business processes as Web Services promises to lower integration costs, organizations must be aware of these costs and plan accordingly when budgeting for BPM projects, particularly in the near term.

Software Pricing Models for BPM

Respondents are looking for alternative pricing models to replace the price-per-user and price-per-CPU schemes that have dominated software pricing in recent years. Many (27%) said that the fixed price development environment model followed by application server vendors would be attractive. Process design and maintenance is similar in many ways to server-based application development and administration, so this model makes sense for the current generation of BPM offerings.

The high ranking of service level agreements (24%) and usage-based subscription fees (18%) suggest that the Business Service Provider (BSP) model is a viable

one. BSPs combine application hosting with domain-specific process knowledge and services. As Web Services and BPM become more intertwined, the attractiveness of purchasing combined application and process services from BSPs based on these pricing models increases.



Vendor Selection Priorities

The largest group of respondents (36%) will select their BPM software based on perceived value, defined as the best possible combination of price and service. Value is always an important consideration in the vendor selection process, but it becomes paramount in difficult economic times. The U.S. economy is likely to remain stalled until mid-2002, yet most respondents said that they will purchase BPM software during the next year. This combination of circumstances leads to the high priority placed on the value of BPM solutions.

Another large group of respondents (32%) said that they will base their selection of a BPM vendor on the match between available products and actual business requirements. This is the only way to choose best-fit solutions and should be considered in tandem with the value offered by the BPM vendor. Once decision-makers have narrowed the range of potential vendors and products to those that meet the process management needs of their business, then they should compare price and levels of service to make a final decision.

Expected Benefits

There is ample opportunity for BPM vendors to deliver great benefit to their customers. Respondents pointed to several significant benefits that they hoped BPM would deliver. First, they want to be able to automate repetitive tasks (30% of respondents). Second, they want the ability to manage and monitor the performance of processes (25% of respondents). Third, they want to be able to have business users modify process logic without the need for IT help (20% of respondents).

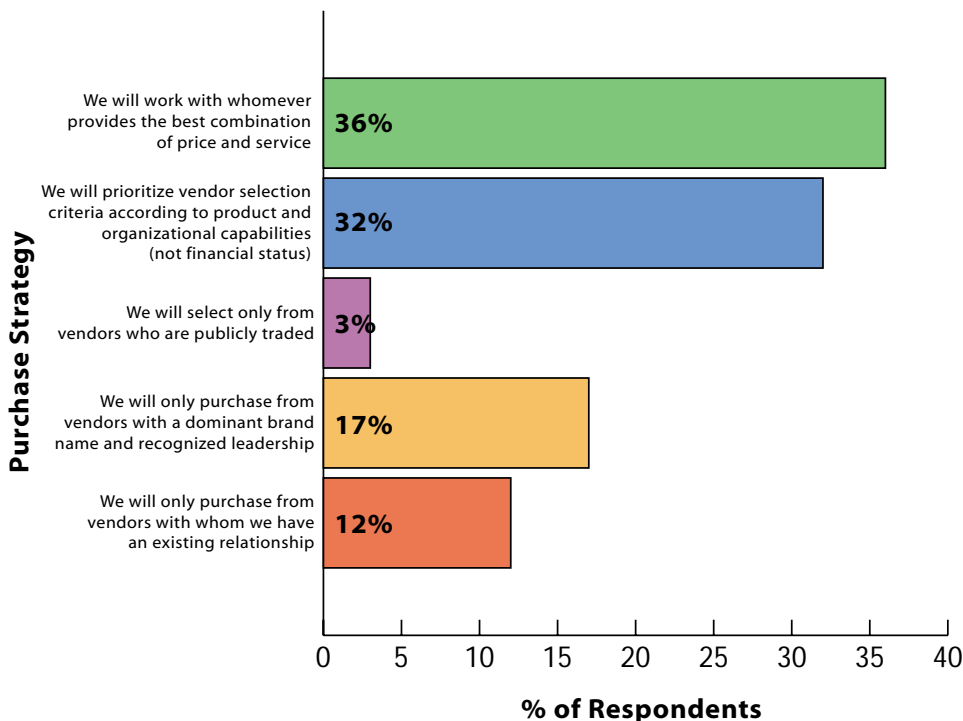
Buying Power Shifts to the Business User

Most organizations recognize that processes are best designed and executed by the managers responsible for them. As technology became an increasing better conduit for process management, process design began to fall more and more on IT. This led to a disconnect between business managers and IT employees—a disconnect that often led to sub-par process management initiative. Organizations are now looking to BPM solutions to work with the existing IT infrastructure (to make IT managers' lives easier) and be configurable by business analysts. Over 61% of respondents indicated that line-of-business managers are responsible for defining the rules and business

logic involved with BPM; less than 12% indicated that IT is responsible—companies are starting to “get” it. The ability to separate the definition and management of business logic from the design and execution of enterprise software is one of the critical attributes of any BPM solution.

Proof that this understanding of BPM is developing: more than half of the respondents recognized BPM as a “newly emerging layer of software for building new process-based applications and leveraging resources of existing enterprise applications.” Further evidence that BPM has begun to stand on its own, only 10% of respondents view it as a subcategory of the existing EAI software segment, despite promotion of this notion by some industry analysts.

Short-term BPM Purchasing Strategies

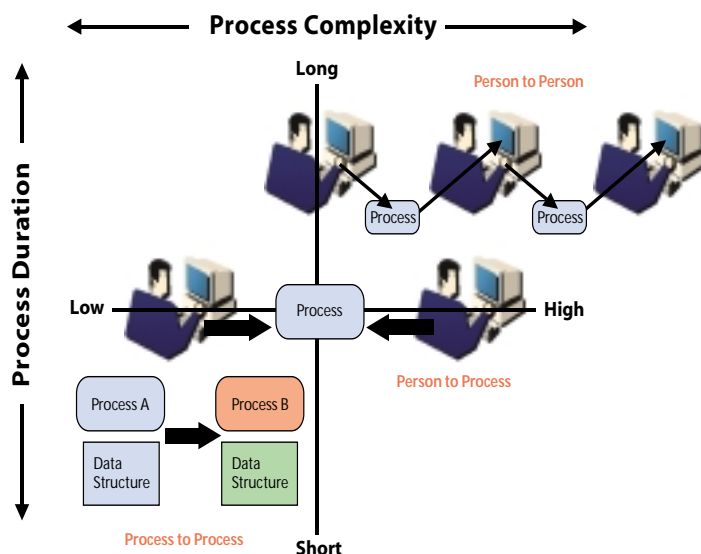


Defining the rules and logic of processes is a key aspect of BPM. It is key in the sense that BPM needs to deliver on the promise of allowing business analysts to change process rules/logic without affecting IT integration. Respondents overwhelmingly indicated that line-of-business managers or e-business managers are responsible for defining process rules and business logic. The vendor opportunity here is to provide these managers with easy-to-use graphical modeling solutions. Within a graphical modeler, vendors can offer boilerplate processes with embedded domain expertise.

Process Categories

Processes can be viewed from several different angles. Delphi first looks at process duration—whether the process is short or long-lived. Next, we look at process complexity—whether the process is simple and straightforward or highly complex.

Within Delphi's view, processes can be grouped into three categories: process-to-process; person-to-process; person-to-person. The graph below depicts these process categories around the axes of process complexity and process duration. Process complexity refers to how complex or simple a process is. A simple process may involve an application-to-application data transfer, such as an ERP transaction, while a complex process may involve several applications and people, such as a product development process. Process duration refers to the length of the process from start to finish. An ERP transaction typically involves simple data transformation and as such, is a short duration process. The product development process, on the other hand, can take months to complete.



The process-to-process category generally falls on the low end of process complexity and the short end of process duration. These processes are discrete and focused on data transformation. The goal is to get business objects from one application to another; the challenge is defining the business logic of transforming those business objects.

Transaction-centric processes are often defined by person-to-process interactions, such as individual validation of an automated task or resolution of an exception to an otherwise scripted process. For this reason, transaction-based process management typically involves repeatable processes with few variations between instances. It is usually state-based, involving person-to-process intervention at specific steps, while the remaining steps are automated (for example, the credit approval process for loans).

Finally, there is the person-to-person category of processes. In this type of process, people are connected for the purpose of collaboration. Collaboration can be process-driven or knowledge-driven and involve explicit or tacit knowledge. While resource scheduling may be more process-driven and based on explicit knowledge, actual project management is typically more knowledge-driven and based on tacit knowledge.

A holistic BPM initiative would ideally address all three process categories, as each serves an appropriate and necessary role within most organizations. Such a solution, however, would need to be comprised of a combination of best-of-breed product offerings as each of the vendors addressing the BPM market today has focused on a specific area of functionality.

Approaching the Market

The research clearly shows that organizations deploying BPM closely associate it with other business computing initiatives, including EAI, B2B integration, process automation, process design, process monitoring and optimization, and Web Services.

Vendors in the marketplace are all approaching BPM from different points of view. Some approach BPM from an integration perspective, having previously specialized in either EAI or B2Bi. Other vendors have histories in workflow, and thus approach BPM from a process design and automation slant.

Delphi has identified several different vendor approaches to the BPM market. Some vendors have experience managing document-centric or

transaction-centric processes and are building on that functionality. FileNET and Optika are two such vendors. Other vendors are coming to BPM from more of a workflow perspective, having much experience with the automation of processes. Fujitsu is one such vendor. Ultimus is a good example of a vendor that has evolved from more of a manual workflow background, building on specialized capabilities in exception handling.

Several vendors come to the BPM market with an integration background. Sterling Commerce, HP, and Staffware all take a process-centric approach to integration, while Peregrine's approach has evolved from B2Bi to internal and external process management and integration. BizFlow is an example of a product coming to the market from a collaboration background. Finally, companies like Fuego and Q-Link have specialized in separating application logic from process logic and approach the market that way. Whatever the approach, the end goal remains the same: to beef up functionality to provide holistic BPM.

Respondents indicated several drivers that will play a significant role in their selections of BPM solutions. Mentioned most by respondents (23%) was document or content management; second was EAI solutions (23% of respondents); third was enterprise applications (20% of respondents). Other drivers were e-mail environment, message broker (not related to e-mail), and transaction processor.

These findings are important in that they point out the need for BPM solutions to support several types of processes, each with varying requirements. Processes may be integration-centric, collaboration-centric, or transaction-centric. Each of these process types has individual characteristics with regard to process duration and process complexity. For example, transaction-centric processes tend to be long-duration, high-complexity processes. At the other end of the spectrum are integration-centric processes, which tend to be short-duration, low-complexity processes.

Given that enterprises run all of these types of processes, BPM solutions must become umbrellas for all of these types of processes—companies must support processes of all durations and complexity levels. For the time being, these solutions will likely come from a combination of best-of-breed vendors. BPM solutions need to develop capabilities that span the spectrum from data transformation and case management to alert notification and exception handling.

A BPM & Web Services Glossary

BPM (Business Process Management): enables the design, analysis, optimization, and automation of business processes. It does this by separating process logic from the applications that run them; managing relationships among process participants; integrating internal and external process resources; and monitoring process performance.

Web Services: business assets that can be shared, combined, used, and reused by heterogeneous computing resources within an organization or between firms. Technically, a Web Service is an XML object comprised of content, application code, process logic, or any combination of these, that can be accessed over any TCP/IP network using the SOAP standard for integration, the WSDL standard for self-description, and the UDDI standard for registry and discovery within a public or private directory.

API (Application Program Interface): the interface by which an application program accesses an operating system and other services and applications.

B2Bi (Business-to-Business integration): automated exchange of information between different organizations. Typically refers to the integration of information systems between an enterprise and its partners, customers, distributors, suppliers, etc.

CORBA (Common Object Request Broker Architecture): non-language-dependent integration technology for distributed applications (allowing the applications to communicate with each other); maintained by the Object Management Group (OMG)

EAI (Enterprise Application Integration): the unrestricted sharing of data throughout the networked applications or data sources in an enterprise.

J2EE (Java 2 Platform, Enterprise Edition): a single-language, multi-platform development framework for delivering enterprise applications. The J2EE platform is a collection of related technology specifications that describe required APIs and policies.

JCA (J2EE Connector Architecture): defines a way for enterprise applications to communicate with Enterprise Information Systems. The main components are the resource adapter, system contracts, and the Common Client Interface, or CCI.

JMS (Java Message Service): an API that supports messaging between computers in a network. JMS is a specification that defines the Java language interface to a messaging service and a means for exchanging XML-based transactions.

MOM (Message-Oriented Middleware): generic message router utilizing asynchronous (one-way) communication to deliver messages in a format known to both the client and the server. More complex than an RPC system, but less complex than a CORBA/RMI system.

SOAP (Simple Object Access Protocol): a protocol for exchange of information in a decentralized, distributed environment. It is an XML-based protocol that consists of three parts—an envelope that defines a framework for describing what is in a message and how to process it; a set of encoding rules for expressing instances of application-defined datatypes; and a convention for representing remote procedure calls and responses. SOAP is a key standard for delivering Web Services.

TCO (Total Cost of Ownership): calculation designed to help managers assess both direct and indirect costs and benefits related to the purchase of IT components.

UDDI (Universal Description, Discovery, and Integration): a platform-independent, open framework for describing services, discovering businesses, and integrating business services using the Internet.

VPN (Virtual Private Network): private data network making use of public telecommunication infrastructure, maintaining privacy through the use of tunneling protocols and security procedures.

WSDL (Web Services Definition Language): an XML format for describing network services as a set of endpoints operating on messages containing either document-oriented or procedure-oriented information.

XML (Extensible Markup Language): a form of self-describing data that creates common information formats in order to share both the format and the data across the Internet, intranets, and other networks. XML frees Internet content from the browser, making it available to real applications.

A Look at BPM Software

Each BPM software application is defined by a mix of several components. Some solutions will have all of the components, while others will specialize in offering one or two components. These components—process design, process monitoring, process operation (automation and integration), and technology platforms—will weight heavily in the selection criteria of BPM for the next few years.

Process Design

The ability for the business analyst to design processes without needing to have any programming skills is one of the major promises of BPM solutions. Current vendor offerings include graphical UIs with drag-and-drop technology to make process design as intuitive as possible for the business user. A robust process design module will support all process assets (i.e. information and people), sub-processes, parallel processes, creation of business rules, and exception handling among other things.

Process Monitoring

It is difficult to overstate the importance of process monitoring. One of the major goals of BPM is to realize continuous process improvement. Thus, BPM vendors are offering more and more capabilities in this area. Almost all vendors offer at least some sort of administrative console with metrics and reporting capabilities. Other vendors specialize in process monitoring and offer enhanced analysis functionality. Through reports and analysis, companies can take steps towards process optimization.

Process Operation

The actual operation, or execution, of a process is what most people would commonly call first-generation workflow. Still today, a traditional workflow vendor may only offer process operation capabilities. More likely, though, a vendor will build upon its workflow capabilities and offer a more holistic solution.

There are several important process operation features that vendors are prominently featuring today. First is run-time modification of processes. Users need to know that, if anything goes wrong with their process, they can quickly make changes while the process is running and not lose time by starting over from the beginning.

Second, workload balancing is a necessity. In today's hectic business environment, both people and applications will get overloaded, meaning that the BPM solution will have to balance the work between all parties in the most efficient manner.

Third, users are depending on version and change management from their BPM solutions. This can be for learning purposes (to review process iterations), legal purposes (to have a record of every activity), or simply for contingency purposes (in case a disaster occurs). Finally, users need a UI into the process, especially for the completion of manual process tasks. We will look more at the UI for process participants in the integration discussion.

There are two aspects of process operation that require an in-depth look at BPM components in and of themselves. Both automation and integration are extremely important pieces of the BPM puzzle. Both fall under the operation umbrella, yet traditional workflow does not adequately address both automation and integration.

Automation

First-generation workflow is most related to process automation. The goal of early workflow technologies was to automate repetitive tasks in order to save people time. In order to provide automation, vendors offer functionality such as:

- notification services (i.e. proactive e-mails) to automate people-intensive processes,
- support for nested processing, where sub-processes invoke other sub-processes in succession, and
- invocation of services in order to execute processes regardless of modeling language while persisting state and data between service calls.

Integration

Connecting all process participants, whether they be humans or applications, is one of the most important prerequisites to implementing successful processes. In the past, organizations have allowed applications to drive how processes are conducted, regardless of their effect on the business.

Today's enterprise is becoming smarter and realizing the benefits of a process-centric approach. In order to achieve a process-centric view of the world, a company

must separate application logic from process logic so that process changes do not require reconfiguration of integration schemes. Imagine having to reintegrate every time a process needed to change—nothing would ever get done. BPM vendors are now focused on allowing this separation of application logic from business logic.

In order to meet the integration needs of consumers, vendors are either offering functionality themselves or partnering with EAI-specific vendors. At its core, integration is simply the connection of people and information within a process. To connect application information, vendors use APIs or messaging services. To connect people (and their inherent knowledge), vendors use UIs that have the look and feel of e-mail inboxes to include human users within the process.

Technology Platforms

There are two major technology platforms for BPM deployment: J2EE and Microsoft-centric. BPM vendors are choosing one, the other, or both. Some feel that J2EE is the platform of the future, while others choose Microsoft because that's what their existing customer base demands. Most vendors, though, are aiming for deployability on both platforms. Delphi's research validates this latter strategy, that the notion of a single platform is still in its infancy and it's too early to put all the eggs in one basket.

As previously mentioned, vendors are entering the BPM market from a variety of different software segments (EAI, workflow, et al) with each offering specific experience with the management of different types of processes. The challenge for all vendors will be to develop support of all process types. For example, vendors that focus on EAI today will need to develop capabilities in managing more complex and longer-lived processes.

Web Services: A Growing Mandate for BPM

It is difficult to discuss BPM without also discussing Web Services, nor Web Services without BPM. As the impact of Web Services begins to grow within many organizations, so will the degree of complexity surrounding this new enterprise computing paradigm. To fully leverage the advantages offered by Web Services in the delivery of application resources and information requires the same type of coordination as provided by BPM software in the management of business processes. It is important to note, however, that more than half of the survey respondents felt that

BPM Standards -- BPMI.org

Delphi's research indicates a strong interest in how standards will evolve for BPM and Web Services. In fact, many corporations put initiatives on-hold as they wait to see how standards play out. One organization that is taking a lead in driving standards for BPM is BPMI.org (the Business Process Management Initiative). BPMI.org is a non-profit corporation whose goal is to empower companies of all sizes, across all industries, to develop and operate business processes that span multiple applications and business partners, behind the firewall and over the Internet. The Initiative's mission is to promote and develop the use of Business Process Management (BPM) through the establishment of standards for process design, deployment, execution, maintenance, and optimization. BPMI.org develops open specifications, assists IT vendors with marketing their implementations, and supports businesses with using Business Process Management technologies.

The Standards Push

On the back-end, technology integration standards such as XML Schema, SOAP, and J2EE enable the convergence of legacy infrastructures toward process-oriented enterprise computing. On the front-end, emerging protocols such as ebXML, RosettaNet, and BizTalk support the process-level collaboration among business partners. BPMI.org leverages those converging trends by driving the development of technologies that help companies to develop and operate business processes that span multiple applications and business partners, behind the firewall and over the Internet.

BPMI.org defines open specifications, such as the Business Process Modeling Language (BPML), Business Process Query Language (BPQL), and Business Process Modeling Notation (BPMN) that will enable the standards-based management of e-business processes.

BPMI.org and ebXML are addressing complementary aspects of e-business process management. While ebXML provides a standard way to describe the Public Interface of e-business processes, BPMI.org provides a standard way to describe their Private Implementation.

BPMI.org is driving the creation of BPML for the private implementation part (proprietary to each

business partner) of a process. The Business Process Modeling Language (BPML) is a meta-language for the modeling of business processes, as XML is a meta-language for the modeling of business data. BPML provides an abstracted execution model for collaborative & transactional business processes based on the concept of a transactional finite-state machine.

BPML considers e-business processes as made of a common public interface and as many private implementations as process participants. This enables the public interface of BPML processes to be described as ebXML business processes or RosettaNet Partner Interface Processes, independently of their private implementations.

In much the same way XML documents are usually described in a specific XML Schema layered on top of the eXtensible Markup Language, BPML processes can be described in a specific business process modeling language layered on top of the extensible BPML XML Schema. BPML represents business processes as the interleaving of control flow, data flow, and event flow, while adding orthogonal design capabilities for business rules, security roles, and transaction contexts.

Defined as a medium for the convergence of existing applications toward process-oriented enterprise computing, BPML offers explicit support for synchronous and asynchronous distributed transactions, and therefore can be used as an execution model for embedding existing applications within e-business processes as process components.

BPMI.org is driving the creation of BPQL to be a standard management interface for the deployment and execution of e-business processes. The Business Process Query Language (BPQL) is a management interface to a business process management infrastructure that includes a process execution facility (Process Server) and a process deployment facility (Process Repository).

BPMN will be a notation for the development of BPML processes at the business level. Where BPML is used to carry process semantics among computer systems and software applications, BPMN will assist the communication of business processes among business and technical users, working to bridge the gap that exists today.

process management standards were missing from current Web Services offerings. This points to a fundamental relationship between BPM and Web Services.

Web Services Becoming Clearer in the Near Future

Those following the development of Web Services closely know that there are about as many definitions of the term as there are people offering one. Delphi Group defines a Web Service as an XML object comprised of content, application code, process logic, or any combination of these that can be accessed over any TCP/IP network using the SOAP standard for integration, the WSDL standard for self-description, and the UDDI standard for registry and discovery within a public or private directory. Expressed in non-technical terms, Web Services are business assets that can be shared, combined, used, and reused by heterogeneous computing resources within an organization or between firms. The user may be a human being or a machine.

There seems to be a bit more confusion surrounding Web Services than BPM. Asked to define Web Services, respondents gave answers ranging from “collaborative commerce enabler” (75% of respondents) to “Internet business model” (57% of respondents) to “Web site development environment” (42% of respondents) and “software development paradigm” (42% of respondents). As more businesses experiment with Web Services, they will begin to better understand the specific applications of this computing model and, undoubtedly, discover new ones.

It is important to understand the underlying standards that go along with Web Services. While nearly one-quarter of respondents were unfamiliar with the Simple Object Access Protocol (SOAP), the majority correctly indicated that it is a standard interface that allows applications to integrate with one another. Very few respondents (3.2%) confused SOAP with the Universal Description, Discovery, and Invocation specification (UDDI), but a significant number (15.9%) incorrectly defined it as a means to describe a Web service, which is the function of the WSDL standard.

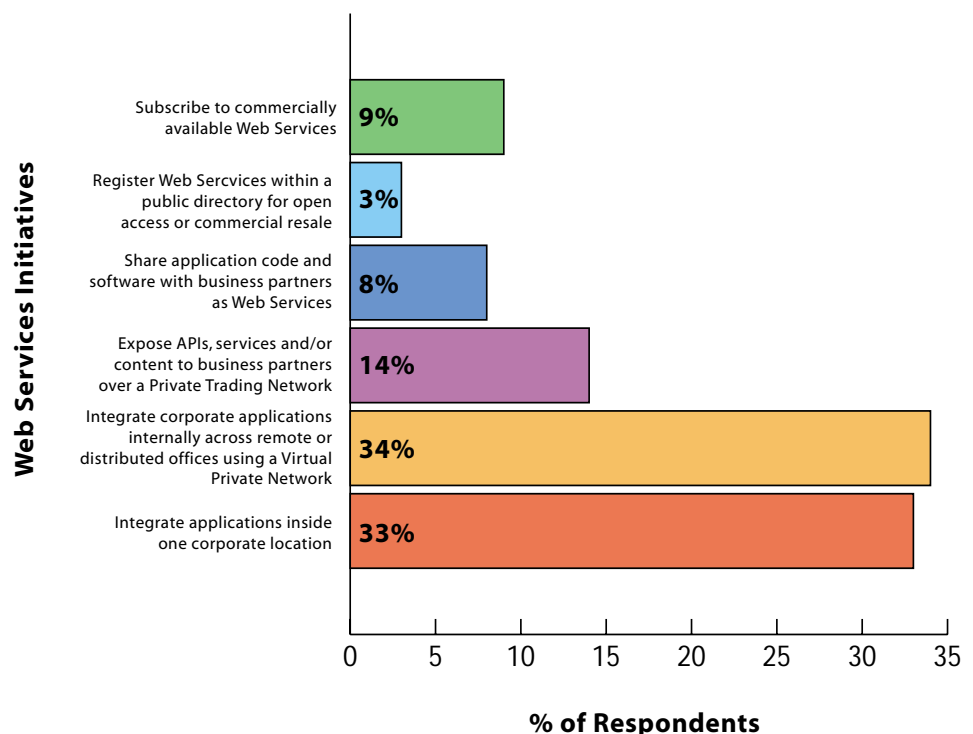
These levels of unfamiliarity and misunderstanding are natural for a technology that is just beginning its first wave of adoption. Web Services are largely conceptual for many potential users and much education will be needed to correct misconceptions that have been formed already.

Respondents do recognize XML, SOAP, JCA, UDDI, and WSDL as having large roles in Web Services strategies. XML is clearly the foundational technology upon which Web Services will rest. The standard was nearly a unanimous choice, indicating that it is a “must have” component of Web Services. The majority (53%) of organizations taking part in the survey have begun to enable their applications to leverage information represented in XML. Respondents also seem to grasp the importance of SOAP—70% indicated that they have either already begun to enable business applications with SOAP interfaces or they will do so within the next 12 months.

The Infrastructure of Web Services

Organizations are taking varied approaches to the uncertain infrastructure requirements. Many organizations, 41% of respondents, are creating a mixed (J2EE and Microsoft-compliant) environment for deployment. This is compared to 36% of

Web Services Initiatives Priorities



organizations that have committed to a Microsoft-centric environment and 16% who have committed to Unix and J2EE.

Whether they are clearly understood or not, Web Services are here to stay—only 25% of survey respondents have no plans to implement Web Services. Importantly, 39% of respondents plan to implement Web Services within the project area of BPM, solidifying the relationship between the two. Other project implementation areas for Web Services include enterprise portals (53% of respondents), content management (37% of respondents), EAI (39% of respondents), CRM (29% of respondents), and e-Commerce (39% of respondents).

State of Web Services Deployments

Many organizations (34% of respondents) are not sure of when they will begin using Web Services for distributed processing of large computational tasks. For those that do know, the timeframe is quick, typically by 2003 these companies will be utilizing Web Services for distributed processing.

Where Web Services Fits

Organizations are also beginning to think about where Web Services fit within their organization. While there is no one clear department or initiative with which Web Services fit, the most popular were: enterprise portals (21% of respondents); BPM (15% of respondents); and EAI (15% of respondents). It is clear from these responses that companies are looking for EAI to deliver information, whether in a portal, in the context of a process, or between applications.

Web Services are widely viewed as a means to extend existing investments in information repositories, applications, and business processes. Therefore, we can make some assumptions about where Web Services will be applied first, based on what organizations have in place that may be shared internally and externally.

Over two-thirds of respondents (70%) have a business portal project underway. It makes sense that these organizations will use Web Services to integrate information, applications, and processes into these portals, rather than building hard-wired portlets that must be recoded each time an application or process changes. Additionally, portal deployments are reaching more frequently across the firewall. As this trend continues, the business portal will become the place where individuals build, publish, access, and use Web Services.

The concept of dynamic object integration is not new to many individuals managing unstructured enterprise content. Most content management applications are adept at creating virtual documents on the fly by assembling disparate content chunks into a single framework. Web Services provide a standards-based means to broadcast, aggregate, and use content, which will replace the proprietary methods currently used by most content management vendors.

Nearly half of the survey respondents have a Business Process Management (BPM) project underway in their organization. Process integration is the next focal point for those companies that have successfully integrated content and applications in their computing environment (often through a business portal.) As more organizations codify and modify their internal processes and those shared with external value chain members, they will use Web Services to integrate those processes with content and applications, providing best practice business context to the information used by their knowledge workers.

Integration Drives Early Evolution of Web Services

Survey respondents indicate that early Web Services initiatives will revolve around a select few areas. Application integration, whether inside one corporate location or across several locations via VPN, will be an early driver of Web Services initiatives. In fact, respondents see cost-effective integration of internal applications as the primary benefit to be derived from Web Services. Once companies are comfortable with the results of those initiatives, they will likely move on to exposing APIs and services to business partners over the Web and subscribing to commercially available Web Services.

Impediments to Web Services

Of course, there will be obstacles as companies begin to test the Web Services waters. Currently, respondents felt that there are several features missing from Web Services offerings. Process management standards, distributed authentication (between Web Services and business objects), quality of service metrics and monitoring, non-repudiation (transactional integrity and delivery guarantees), and the ability to syndicate more than data and content are chief among the features that users would like to see in a more holistic Web Services offering.

In addition to missing features, respondents site other obstacles to Web Services implementations. Multiple

standards can get in the way as IT managers decide to wait to see how standards play out. Many enterprises are also cautious because of a lack of experience in building services-oriented architectures. Some are worried about the effect on corporate culture. And, many simply don't see a business case for Web Services.

Web Services Press On

Despite the lack of a coherent definition of Web Services, organizations are taking greenfield approaches to implementation, choosing to use internal resources to deploy Web Services (77% of respondents) over using business partners with greater experience (36% of respondents). They are doing this despite 19% of them seeing lack of experience in building services-oriented architecture as being the largest obstacle to the implementation of Web Services. Other perceived obstacles to Web Services implementations include multiple standards implementation methods (18% of respondents), lack of a business case (15% of respondents), and the change required in organizational culture (18% of respondents).

The lack of understanding of Web Services is not a deterrent to implementation initiatives. Predictably, organizations are taking different approaches to accounting for Web Services. One-third of companies see Web Services as being a cost center within their organization, one-third see Web Services as being a profit center, and the final third are cost-neutral at this point.

As they press on with Web Services initiatives, companies will use a variety of metrics to measure the success of their implementations. Organizations will be looking at how a Web Services architecture helps them with utilization of existing infrastructure and software assets (43% of respondents), use internal development resources (38% of respondents), deployment time (40% of respondents), initial deployment costs (25% of respondents), and ability to lower TCO (18% of respondents).

Organizations Are Thinking Small Dollars—For Now

The largest group of respondents (23%) expects to spend less than \$100,000 on Web Services projects within the next three years, and the next largest group (18%) anticipates spending less than \$250,000 during the same time period. Spending is generally proportional to the size of an IT project, so one must assume that these groups envision starting with small

Web Services initiatives. However, one of the promises of Web Services is the extension of existing IT assets as opposed to wholesale replacement of systems. In many instances, deploying Web Services will not force new investments in hardware or applications and will require only limited spending on XML and SOAP coding.

IT history teaches us that most projects come in over budget, often because not all the costs were identified and planned for up front. In the case of Web Services development and deployment, it is easy to overlook necessary initial expenditures such as developer training and third-party architectural services, as well as recurring costs, such as maintenance of Web Services components. Many firms will find that their original projections for Web Services spending were overly optimistic or simply ill informed.

Pricing of Web Services

As the market evolves, vendors will learn where their services fit and how they play into the market. What is clear now is that companies do not want to pay outrageous per-CPU or per-user prices for Web Services solutions, which is the same way they feel about BPM solutions. Most enterprises would prefer to pay either a fixed price, pay based on service level, or pay on a subscription basis. This pricing demand shows that organizations are taking a pay for play approach to Web Services. Because companies are now experienced when it comes to buying technology, they know they have the right to make sure it performs the way it should. This is an important consideration for vendors as they approach the market.

Summary

The research certainly points to an exciting few years ahead in relation to both BPM and Web Services. BPM vendors are well-positioned to ride the wave of Web Services as the evolution of that market occurs. Web Services will not replace BPM functionality; rather, Web Services will enhance the ability of BPM vendors to deliver real value to their customers.

Delphi has the unique perspective of working with both end users of these technologies as well as vendors. The evolution of BPM and Web Services is of particular interest to us because of the potential for these technologies to solve real business problems for end users.

FileNET: A BPM Summary Report

Overview

For the past 18 years, FileNET has been a pioneer in workflow and process management. Now, the company has evolved to the next step—Business Process Management (BPM). This is delivered through 3 brands, Panagon for ECM, Brightspire for Collaborative Commerce, and Acenza as the application platform.

Panagon is an integrated eProcess and Content Management infrastructure and application development platform for automating business processes and associated content. Brightspire is a business integration framework that extends and manages processes across the enterprise. The Acenza suite of vertically-oriented applications provides organizations the ability to link customers, partners, and employees within shared processes.

The goal is to provide a company with the ability to manage enterprise processes and integrate process and content. With Panagon, content consists primarily of unstructured data, while with Brightspire, content can be any enterprise data. With such capabilities as synchronization of multiple processes, the ability to connect to enterprise applications, scalability and broad deployability, FileNET BPM is addressing the whole spectrum of Business Process Management.

Web-based access to processes is an important feature of FileNET BPM. Others include: multiple environments (authoring, administrative, and participation); available online help; and efficient integration with other FileNET products.

FileNET also includes features centered around process automation, process improvement, resource and work management, and development and system administration. Additionally, Brightspire provides support for both short duration, zero-latency processes, as is typical of EAI deployments; as well as long-lived, persistent processes commonly associated with enterprise process automation.

Process Modeling

Cumbersome systems can discourage users from taking advantage of all of the functionality of a tool. FileNET offers tools for the business analyst,

administrators, developers, and end-users. The product gives users a drag-and-drop GUI for creating process maps and utilizes object-oriented technology—facilitating reusability in designing and authoring processes.

Users also have access to process templates so as to facilitate faster process deployment. Additionally, FileNET offers submaps to facilitate the creation, maintenance, and tracking of complex processes. Submaps enable module design through the encapsulation of business logic into process modules.

FileNET supports various process types, such as user-driven, queue-driven, and application-driven. Because all process maps are stored in XML format, FileNET enables reusability, versioning and check-in/out functionality across the enterprise. It also means that internal and external communications are enhanced through support of process-to-process communications and submaps/nesting.

Process Monitoring

When implementing a BPM solution, a core component is the ability to analyze process information so as to improve performance. To this end, FileNET supports the tracking, monitoring, and managing of workflows.

FileNET keeps event logs for process analysis. Through reports, process activities remain visible to managers and managers gain control over process performance. Continuous analysis of reports can allow managers to improve processes through reengineering.

Process Operation Capabilities

A key feature of FileNET is the ability to synchronize multiple processes. Synchronization enables one process to wait until a separate process is created or gets updated according to specified criteria. This application is especially good in cases where double-checking is needed and mistakes are not tolerable. For example, a new hire process could check for confirmation of previous employment through a separate or sub-process before creating an employment offer letter. And with FileNET, separate processes can run in parallel before converging—one process does not have to wait for another.

FileNET is a company experienced in Enterprise Content Management (ECM). To enhance the integration of Panagon eProcess Services within ECM,

FileNET has added the ability to enable attachment of Internet links to processes, as well as other forms of content, such as images and documents. Also, processes can be auto-launched when documents are added or checked into Panagon Content Services, with defined processes being associated with either document classes or a specific document.

In the UIs dealing with document attachments, users can leverage the HTML-based search dialogue to select a document. This is in addition to browsing through the folder structure of a repository. It can make the management of attachments easier, especially when working with large image services libraries that may not have an existing folder structure.

Automation

FileNET offers an XML-based business process management application that is 100% browser-based. Because it is available via the Web, users do not need to load FileNET software on every computer in order to use the workflow engine. In this way, all business process automation can be achieved.

FileNET can make process automation easier for companies by offering flexibility in how processes are driven—processes can use either the push or pull models of work. There is also support for both parallel and conditional work routing, meaning that dependent processes can run together and events can be directed to the best place at the best time. Also, a back-end server to monitor work queues and repositories makes automation easier to manage.

Also included is an SMTP-based e-mail notification service—providing work assignments or status changes to users on a proactive basis. These notifications, which have customizable formats, contain URLs that can be used to process the assigned work and/or view its current status. This could be especially valuable for people who may not interact with processes on a regular basis, rather only when manual intervention is needed.

Integration

Today, processes often have steps that are executed both inside and outside of the organization, by a division halfway around the world, a customer, or a partner. Brightspire can deliver expanded capabilities for managing all forms of content and business processes inside and outside of the enterprise.

Brightspire can connect with packaged applications, legacy systems, and integration-specific software tools and has both a connector and messaging architecture. Brightspire embeds third-party EAI tools to provide integration between applications used within a process. As a result, an event from an application can launch a process. For example, a CRM event from Siebel can launch a process through Brightspire. The inverse is also true—a content engine event can trigger an EAI collaboration. These EAI collaborations can create, retrieve, update, and delete content engine flat and hierarchical objects, allowing information within the process to be dynamic.

In the process category diagram on page 7, we look at processes based on their complexity and duration. Brightspire's integration capabilities, coupled with its support of publish/subscribe functionality for long-lived processes allows it to address all categories of processes: application-to-application, people-to-application, and people-to-people.

Technology Platforms

The FileNET platform provides an open architecture, facilitating the development of application infrastructure that is able to handle the demands of Web-based deployment of business solutions—it is deployable in both Unix and Java environments. The FileNET BPM platform supports either the Microsoft Windows, HP-UX, Sun Solaris or IBM AIX operating systems. Either SQL Server or Oracle will work as the database system with Microsoft- or Solaris-based Web servers.

Scalability and Deployability

FileNET BPM is configurable and scalable to support thousands of users—so it supports truly enterprise-wide deployment. Additionally, it automatically recovers in the event of any workstation failures. Finally, it is not necessary to worry about the wrong users getting involved through automation of a process because there are flexible security options and role management capabilities built into the product. User information in an NT Domain can be leveraged by importing this information into FileNET Security Services for all of the involved server components.

Standards Participation

As previously mentioned, FileNET is a pioneer in workflow, with over 18 years of driving workflow

solutions. The company has been active in helping to develop standards for the industry. FileNET is a founding member of the WfMC and one of the early members of BPMI.org.

Case Study: Wells Fargo Private Client Services

Wells Fargo is a diversified financial services company with over \$280 billion in assets. The company's Private Client Services (PCS) group manages more than \$131 billion in assets, of which more than half is for high-net-worth investors. Because there are PCS offices throughout the U.S. and several recent acquisitions by the company, the PCS group had to deal with several disparate trust content management systems, ranging from software-based systems to microfiche.

The growth in the company began to cause duplicate work in each PCS office—time-and-labor-intensive tasks begin to negatively affect customer service. Decision-making became difficult and hunting down relevant information took too much time. Wells Fargo needed a system that could allow managers to access information through the Internet in order to handle as much work online as possible. This could cut costs, through the switch to thin-client technology, and do away with the local management of files.

Wells Fargo chose Brightspire to Web-enable its key trust administrative transactions. Brightspire has allowed PCS to automate traditionally paper-based processes to free up time for employees to deliver better customer service. With this new system, PCS employees can leverage the Web to complete process tasks and access trust documents that have been scanned into the system—not only is the process automated for the employee, but Brightspire helps to eliminate errors.

When the new, Web-based discretionary payments process was deployed, trust administrators were able to view client's files online and alert clients to any missing information. All relevant information could then be automatically forwarded to trust officers, who review the information and render a decision. Notification of this decision is then forwarded to a trust office, where the system issues a letter of decline or approval, then updates databases. If approved, the system will automatically transfer funds.

The benefit to Wells Fargo is multi-fold. The customer experience has improved because the time required to

make a decision on discretionary payment requests has been slashed by two-thirds. Sales have increased because trust administrators have more time to work closely with their clients. Furthermore, the rest of the organization is seeing the results that PCS is getting, increasing overall interest in process optimization.

Fuego: A BPM Summary Report

Overview

Business Services Orchestration (BSO)—the ability to coordinate a multitude of network-based application services— is the backbone of Fuego’s capabilities. BSO is a process-driven method of coordinating and managing both internal and external business services, which may relate to either data transformation, application functionality, or human interaction. The aim of Fuego’s BSO is to facilitate the execution of business processes and eliminate hurdles presented by underlying systems.

The application of EAI software is best suited for processes involving data transformation from one form to another where the focus is on moving data from one application to another and little or no human intervention is required. Where EAI falls short is where process complexity increases and necessitates human involvement to handle exceptions. This issue underscores the fundamental difference between traditional integration infrastructure (such as EAI software) and the emerging class of software focused on BSO. Specifically, as complexity increases, greater inherent intelligence is necessary to manage process exceptions and to apply business logic independent of underlying applications and infrastructure.

Fuego’s BSO combines the functionality of BPM, B2Bi, EAI, and Web Services all within the same framework. Fuego offers a Java-based development platform for quickly building or changing business processes. The company’s Process Designer breaks apart the middle application layer of the traditional 3-tier IT architecture by creating a process layer between the application and presentation layers. By doing this, Fuego’s Orchestration Engine can call up underlying services from applications and deliver them regardless of their type (COM, CORBA, etc.).

By exposing business rules and logic in a separate process layer, the process is understandable and easily modifiable, even for non-IT people. Fuego’s Java-based platform generates a business process management supervisory application that enables trading partners, customers, employees, and existing applications to function as a single value chain.

Process Modeling

At the front end of Fuego’s BSO architecture is the Process Designer, which a business analyst uses to capture the details and steps of the business process, using drag-and-drop icons. Under the icons is a Component Integration Language (CIL), which, together with the Component Manager, is used to define business rules that are used to integrate and execute any business service.

It is the Process Designer that separates the business processes, logic, and rules from the underlying application components. It produces a business process template that is executable and published to the Fuego Orchestration Engine, to generating a complete Java application from a UML diagram.

Fuego’s Process Designer puts process design into the hands of business analysts. They can create a virtual model of the process and define the roles of individuals and groups through a drag-and-drop interface. When deployed, the Process Designer automatically and instantly generates the connectors and metadata needed to orchestrate the business services within processes.

Process Monitoring

Fuego’s Process Analyzer enables the measurement and monitoring of business processes in action. Analysts can drill down on current and historical transactions, pinpointing work concentration, slow downs, and bottlenecks. This can give them the information necessary to reassign resources, change the way work is allocated, or change your business rules all together without a single break in the production cycle.

The Process Analyzer provides graphs and reports to give a holistic overview of the flow of work. It captures information in a centralized Operational Data Store (ODS), then uses OLAP to distill that data into customized management reports.

The Process Analyzer measures the efficiency and effectiveness of the business processes. It can indicate whether processes are meeting requirements and collects and maintains all data that is part of the business processes, storing any process variables in a database. In this way, it enables companies to

understand what is taking place for all business process steps.

Process Operation Capabilities

Fuego's Component Manager provides an interface between Fuego Process Designer and a company's systems. In between the Process Designer and systems is where Fuego conducts a process they call harmonizing. First, a discovery mechanism finds the existing services in the company's systems. The services can be COM, CORBA, SQL, XML Schema data, or countless other types of components because harmonization makes the services homogenous. The harmonization process is the key activity in BSO.

These homogenous services are then represented in a component catalog, which is a process-wide view of all available services. Once components are catalogued, they're available for use without the need for further programming by IT staff. From there, a user has the ability to plug-and-play components/services into a process at any time, for quick, responsive reactions to process change needs.

The Component Manager employs a dynamic, self-extracting adapter facility driven by a service-discovery mechanism. This adaptive technology introspects the metadata from any API to discover the business service and incumbent data, and then adapts those elements to the larger business processes. The Component Manager adapts to a wide range of technologies including Java, HTML, XML, EJB, CORBA/IDL, COM/DCOM, JDBC, SMTP, and JMS. What this gives an organization is the ability to truly change processes on-the-fly without disrupting the company's systems.

Automation

Fuego's Orchestration Engine links defined applications, vendors, trading partners, and employees in the process layer, ensuring timely execution of value chain processes. Through the integration of diverse systems, technologies, platforms, and people, the Orchestration Engine automatically prompts application software and people when a business process needs to be completed. It helps quickly move processes from step-to-step while tracking progression, monitoring performance, providing alerts for overdue items, and maintaining a comprehensive real-time and historical audit trail.

The Orchestration Engine acts as the process layer of an IT architecture, moving transactions through every step in the process. The engine has a fully distributed architecture, meaning processes can run on a federation of connected engines to ensure scalability. The Orchestration Engine applies defined business rules consistently across the board and automatically moves processes along from one step to the next. It informs users of any overdue items, and maintains a comprehensive audit trail.

Fuego's Work Portal is a business user interface that accommodates the human element within processes. The Work Portal presents human participants with a "to-do" list, indicating human roles, tasking specific people with work, and coordinating the relevant automated applications activity. The tasks are presented in a thin Java client as a desktop application, or via a Web browser, for remote users. The interface is similar to an e-mail inbox, giving users a sense of familiarity.

Within the Work Portal, pending tasks/transactions are listed clearly and distinctly. Users can automatically open necessary applications just by clicking on a given task. When a user completes an open item, it is moved on to its next destination in the process.

Integration

Fuego takes a process-centric approach to business integration and enables organizations to quickly develop, generate, deploy, analyze, change, and manage business processes.

Fuego addresses the human element of process integration and captures information regarding individuals, their roles, and their availability. Plus, it blends into the processes information regarding calendar days and holidays, and supports EAI and B2Bi solutions involving multiple organizations and companies. This allows for the tracking of availability of organizational units and individual work schedules, including calendar days, holiday, and vacation plans, so tasks won't be delayed by an individual's absence. Also, it controls which activities are presented to a specific individual for handling.

Most integration scenarios have the application driving the process; thus, the integration is constrained

by the bandwidth of the applications' options. Fuego abstracts processes from applications, allowing processes to drive the applications. This creates an e-business process backbone that can be the application development environment for the future.

This architecture enables companies to send selected, crucial application functions or services over the Internet and provides the ability to make or change any decisions.

Technology Platforms

Fuego is a Java-based development platform.

Standards Participation

Fuego is not involved in standards-driving organizations as the company feels its products will work with any standards that evolve.

Case Study

Iowa Telecom is a large incumbent local exchange carrier (ILEC) with more than 280,000 subscriber lines. The company's process for responding to a customer's request to change long distance providers, PIC CARE, was a labor-intensive, complex process that involved significant manual data entry into three types of systems: switch provisioning, order management systems, and DSET Corporation's ezLongDistance PIC gateway.

To respond to this manually intensive process, Fuego built the FuegoApp PIC CARE Order Management application. This application automated more than 80 percent of Iowa Telecom's monthly influx of 55,000 new PIC change requests. Additionally, the application created a process to manage exceptions that require human intervention. Thus, workers avoided tedious data entry while maintaining control of the process.

Very quickly, Iowa Telecom was able to reduce headcount in PIC processing by 91%, saving approximately \$1.0 million per year and freeing up the remaining personnel to focus on exception handling and management and regulatory reporting. The handling time required to process a PIC change request has dropped significantly, as well. And, programming knowledge is not required to define, refine, and add rules over time to increase automation whenever changes are needed.

Fujitsu: A BPM Summary Report

Overview

Fujitsu's i-Flow is a 100% Java-based business process automation engine that works with the major application servers. It gives business groups the ability to collaboratively plan, automate, track, and improve business processes, all with the goal of helping enterprises become more productive. i-Flow delivers a Web-based business process automation engine that gives developers and administrators the ability to work anywhere at anytime. It can leverage existing infrastructure investments because it integrates to existing environments and was created with an open, flexible, and distributed architecture. i-Flow was developed with a set of Java APIs that facilitate the integration to existing applications.

Process Modeling

Application development can be accomplished via graphical drag-and-drop process design techniques, including run-time process editing. This is a key feature of i-Flow because it gives businesses a chance to keep up with the pace of change in today's economy—their processes can evolve in real time. Modular design allows reuse of existing components.

Business rules can be defined graphically on a process diagram. Complex conditional statements can be defined without any coding work. Complex parallel processing scenarios can be modeled in a drag-and-drop browser environment. Business rules can be further enhanced with JavaScript.

i-Flow is delivered with five out-of-the-box, customizable "clients" for users. A client is simply a user interface that is constructed with reusable components that developers can use as-is, or extend and enhance.

The Development Manager is used to design process templates, then start processes from those templates, modify processes at run-time, access tasks, and check process status and history. The Development Manager was created with process designers, business analysts, advanced users, and supervisory staff in mind. It is used by those employees who know the process best and are responsible for its execution.

The Task Manager is leveraged by users to access and respond to work items. It provides users with to-do lists and access to necessary forms and attachments. It

is the standard interface for those users involved directly in process execution.

The E-mail Work Item client is used to respond to tasks and relevant documents. When a user has a new task to complete, i-Flow will proactively notify them via an e-mail with a link to the task. The E-mail Work Item is used primarily by those users that do not interact with i-Flow on a regular basis. Thus, if they have a task to do, they will be reminded by the system automatically, not have to rely on a last-minute phone call from a manager.

The New Process client is used to create new processes from existing process designs. It usually is embedded in a Web site, where a user can leverage it to begin a new process, such as submitting a complaint.

The Administration client is used to manage versioning, importing, exporting, archiving, or deleting process designs, process instances, and tasks. It is also used to modify or delete user profiles.

Access to the Model and GUI APIs that underpin the 100% Web-based clients is provided along with the source code, enabling developers to further extend existing clients or create entirely new applications. The Model API is used to encapsulate the state of client objects and handle server interactions, while the GUI API components provide the different components of the i-Flow user interface, such as a work list. The client components are designed to easily import to visual development tools. The availability of such components for third-party tools allows reconfiguration, extension, and customization of the client.

Process designers can reuse existing process designs as sub-processes within a parent process. Sub-processes can also be created in run-time should a user realize that a single task requires more steps than initially planned. The product also enables designers to chain processes together at run-time, creating independent processes as required.

Template versioning is provided for management of process models. Users can generate new template versions and enter notes about each version. Administrators manage template states and decide when a template is ready to be published in the production environment. Administrators also determine when to make a published template obsolete.

Process Monitoring

i-Flow maintains a history of every event that occurs in a process, and the audit data can be viewed for any running or completed process. In addition, i-Flow provides reporting in charts about processes, templates, and tasks. These reports contain information about the number of processes and tasks in selected states. Managers can also see how many processes each user has started. Thus, managers can get statistics in the way they need them, whether it be by user or by task.

Process Operation Capabilities

i-Flow produces simple default forms which can be enhanced and modified using commercial HTML editing tools. This means that rather than having to learn and support another forms development environment, developers can continue to use the HTML forms development environment with which they are most familiar. The default forms can be integrated with external data in many ways.

The Document check-in and check-out feature is provided for Microsoft and Unix platforms. Users can attach and view documents of any file type using i-Flow.

i-Flow includes an organizer that provides lists of activities, processes and templates. Users can filter the work list based on many criteria (e.g., viewing only completed activities or accepted activities), giving them a customized view of process activities. Tasks can also be sorted based on priority, identifier or state. Processes can be sorted according to their name, priority and identifier.

i-Flow provides authorized users with the ability to change any aspect of an active process. Users can add or remove tasks, change the routing and business rules, add or remove data items and forms. In process editing, a user can even activate or deactivate steps of the process model. This means that they can return to a previous step in the process if it requires rework. All run-time changes can be performed from the graphical Web-based interface. The edits are stored to a private template, which can be reused later as a new version of the process.

The i-Flow server provides a RMI interface that exposes its objects to applications and client tools. A user may access the server via the i-Flow client, a customized client, or by using the API provided with i-Flow. The client components are used to encapsulate

the state of the client objects and interactions with the server via RMI. The client, server, and adapter components may be installed on different machines to distribute the load, thereby enhancing the scalability of the system. RMI-based component communication exposes objects to applications and client tools.

Automation

Fujitsu came out with a Web-based workflow in the mid-1990s. Soon, the company released a Java technology-based workflow engine, followed by a 100% browser-based workflow engine. This browser-based tool put the ability to design processes back into the hands of business owners. With i-Flow, an organization can automate its practices and procedures and have the process automation system accessible to workers anytime, anywhere.

An important part of automation is supporting time parameters. A timer feature determines deadlines at both a task and process level. Time can be specified relative to a process or a task, absolutely, or periodically. When a timer expires, i-Flow can automatically notify another user or escalate the task to a manager. Timer actions can be fully customized, i.e. timer expiration could trigger an external program.

The i-Flow server is based around the workflow engine. The workflow engine negotiates interaction between clients and other components, enacts processes started by users or programs, and notifies clients of changes in status within a process. The i-Flow architecture is adapter-based to allow integration with third-party products.

Integration

Adapters enable the server to communicate with the other components. A company will only need to install those adapters that suit its configuration. i-Flow's provides several out-of-the-box adapters, and others can be customized. The adapters allow the server to communicate with the necessary IT infrastructure components required in typical process automation environments. There are adapters for such purposes as document management (to store forms, attachments and templates), directories (to hold the user's context and access the directory service to perform role resolution), databases (provides the communication mechanism between the server and a database server), and e-mail (adapter sends e-mail from the i-Flow server to any SMTP-compliant mail server).

Technology Platforms

i-Flow allows developers to rely on a 100% Java server architecture to manage processes. i-Flow's distributed server architecture utilizes industry-standard CORBA/IOP or RMI protocols for object interaction. All components in the environment interoperate via a rigorous set of Java interfaces.

Standards Participation

Fujitsu is part of the following organizations: WfMC, OMG and BPMI.org.

Case Study

iJET Travel Intelligence packages travel-related information based on personal traveler profiles such as passport information, medical history, and itinerary and delivers alerts and reports to customers over a wireless channel or a secure Web page. The company's intelligence operations center is manned by analysts that monitor the globe for travel problems and create useful intelligence for travelers. Every piece of our proprietary intelligence passes through a stringent review process involving geographic experts, subject matter experts, and editors before becoming part of the database—and even then is subject to continual review. All this in order to turn mountains of information into comprehensive, timely, accurate, precise, objective, and personalized travel intelligence.

iJET continually receives updates from more than 10,000 worldwide sources. Once the intelligence is received, it goes through editorial and approval procedures to ensure delivery of only the most accurate information in a most timely fashion. Equally important is the ability to quickly deliver vast amounts of travel information to iJET customers. Without the proper processes and technology in place, the company would not be able to accomplish this.

iJET chose to deploy i-Flow into its internal Operations Work Center. With i-Flow, iJET quickly linked its application server, quality of assurance systems, and the various proprietary software components used for its Travel Intelligence business. This allows for the management of complex, real-time intelligence creation processing and directly supports other iJET product offerings. i-Flow originates, streamlines, and automates the intelligence creation process, making sure that editorial and approval guidelines are met, and delivers the actual travel intelligence information directly to customers.

i-Flow's component-based design and comprehensive Java API were essential to iJET. Because iJET had over 125 systems that intelligence interacts with, the fact that i-Flow could integrate with just about anything played a key role in iJET's decision to use i-Flow.

With i-Flow powering the business, iJET has been able to change its processes as they run and learn about their operation through reporting tools. For example, iJET can use i-Flow's process monitoring capabilities to benchmark iJET's performance versus the leading newswire. Effective process management is what iJET needs to deliver to its employees (ease of use) and customers (timely, relevant information).

BizFlow: A BPM Summary Report

Overview

BizFlow version 7 is a new entrant in the US BPM marketplace. It approaches this market from a collaborative standpoint with the intent being to deliver a Complete Process Advantage. BizFlow is a set of web-enabled collaborative tools (such as its XML interactive Form and SOAP, WSDL, XML & XSL-supported BizCove technology) driven by a scalable business process engine. BizFlow has been positioned to deliver services that span areas from Web Services to legacy system integration. At its core, BizFlow has a business process engine that provides enterprises with process modeling, simulation, automation, monitoring, and re-engineering capabilities. The newest version of BizFlow adds its own SOAP broker, Portal Ready UI, PKI and EDMS integration, Packaged Applications, MS Project integration, and multiple EAI & B2Bi adaptors.

BizFlow has been used by a blend of enterprises and governments to meet both strategic and tactical goals. Enterprises have used BizFlow's automation and streamlining capabilities to achieve Six Sigma results, reduced process life cycles, and competitive advantages. Governments have leveraged its PKI (public key infrastructure), ad hoc routing, monitoring, and built-in Form capabilities to meet GPEA objectives and reductions in administrative costs.

Potential support of evolving Web Services requirements in an integrated enterprise environment is possible with BizFlow 7. By leveraging its SOAP broker, BizCove technology (WSDL, XML, and XSL) along with its other integration capabilities (such as EDMS, MS Project, and future integration with Collaboration tools like Instant Messenger), BizFlow will be positioned to unify content, people, services, and systems.

HandySoft Corporation, a global software company, brings over 10 years of industry experience to the US BPM market, with installations at over 380 sites and more than 2.5 million users. HandySoft is currently publicly traded on the Korean Stock Exchange with a market cap of over \$200 million (USD). HandySoft has brought its BizFlow product to the US with deployments in government and commercial markets, such as the National Institute of Standards & Technology (NIST) and Johnson & Johnson. HandySoft is ISO 9001 certified and has experience delivering collaborative and business process management

solutions to commercial and government customers throughout the world.

Process Modeling

HandySoft's Process Designer and Form Designer provide a Graphical User Interface for process and application development. This provides an intuitive method for business and technical users alike to program their workflows. The Process Designer utilizes a point-and-click interfaces to make things as simple as possible for users.

As the workflow is being developed it can be tested for completeness with the use of a process verifier. This allows the user to isolate any missing components before full simulation. The process can then be tested in a full simulation. HandySoft's software can be set up in a development, or protected, environment that allows for simulation and testing of the workflow processes before they are released into production.

BizFlow also integrates to Microsoft Project. Through an import function within the BizFlow Process Designer, standard Microsoft Project plans can be converted into an automated process. Through this type of project plan automation, organizations can visually monitor their projects and commitments through automatic auditing.

HandySoft provides templates so that companies can quickly deploy common processes. Currently, there are approximately 30 templates available, for such functions as employee evaluation and 401K setups.

Process Monitoring

One of BizFlow's features is its Audit Trail Monitor, which provides a graphical and/or tabular depiction of the workflow process to show the status of the workflow at any point, including the minute details (drilling down even to versioned EDMS documents from multiple EDMS systems at the same time) about processes. The Audit Trail monitor can tell a user who is responsible for the next step in the process, what the event in question is, when a deadline is, and where a process is within its lifecycle.

BizFlow also provides audited, packaged reports to measure the efficiency of processes. There are currently 8 reports included out-of-the-box. A report wizards guides the user through the creation of these reports. Additionally, other reports can be custom-created as needed.

Process Operation Capabilities

BizFlow provides its own workflow engine to route, monitor, escalate, and audit workflow. BizFlow's engine not only routes work and content, but also facilitates collaboration, activity tracking, and information management within the process.

BizFlow includes a form designer that converts any form or document to an electronic format. It can link forms to one or more relational databases through either Open Database Connectivity (ODBC) or ActiveX Data Objects (ADO) to pull data or write data to/from the database. The form designer also has XML mapping capabilities for PKI integration and legacy system mapping. BizFlow's built-in developer makes it simple to design customized applications or link to and interface with other applications and legacy systems. The form designer allows the addition of business rules to forms using VBScript.

BizFlow includes integral log-on security, and incorporates user IDs and passwords set by the system administrator. It offers the option to make passwords required for any workflow activity according to business rules that the organization defines. BizFlow also incorporates an organization's roles and privileges that may be assigned to users, as determined by business rules. Roles determine what users can and cannot do with regard to various workflow activities. BizFlow also provides for three levels of users (user, manager, and administrator) with different levels of access for each, depending on role.

If there are documents that exist outside of the process, they can be brought into the process as attachments. For example, a user can attach a Word document to the process and have it automatically entered into the document management system.

BizFlow can scale in both a local as well as a global operational environment. BizFlow supports clusters of Web and BizFlow servers with one database server and/or collaboration between multiple clusters with separate database servers (which can be globally dispersed). This capability, in conjunction with the support of both MS & UNIX platforms, allows customers flexibility in deploying and scaling up their BPM operations.

Automation

For processes that necessitate much human intervention and action, BizFlow provides a "My Work" folder to each user. This folder acts as an electronic

inbox of work-items that the user needs to complete. When tasks are assigned to a particular user they are automatically routed to the user's folder. Priority tasks are color-coded and listed first in the work-list.

BizFlow supports two types of alerts. The first is a "Built-in notify" alert, which sends an alert through BizFlow notification while BizFlow is open on the desktop. If BizFlow is not actively open, the alert can be delivered via e-mail.

Integration

HandySoft offers support for the latest version of SOAP with the enterprise edition of BizFlow. With the common layer interface that HandySoft's SOAP broker component provides, BizFlow's workflow can deliver the combination of workflow with EAI and B2Bi capabilities. Thus, an organization will have the capability to integrate with compatible internal legacy systems and data, as well as share information with systems external to the organization.

HandySoft has built an adapter to Microsoft's BizTalk for BizFlow. This offering provides users another means of access to collaboration with external business partners and clients. Microsoft BizTalk allows the integration of business processes that span departments, enterprises and applications, so that businesses can enhance relationships with their business partners by exchanging documents, data and processes electronically, and tracking and analyzing the information in these transactions. The incorporation of BizTalk aims to complement the functionality within HandySoft.

A partial list of BizFlow's built-in integration capabilities are: MS & IBM Message Queue; Java, COM & C++ APIs; MS Project; Portal Ready; wireless devices (through XML & XSL technologies); LDAP; and EDMS (including Documentum & Hummingbird).

Technology Platforms

HandySoft's strategy is to maintain deployability in either a J2EE or Microsoft-centric environment.

BizFlow User or Administrator

- Platform: Windows Family (Windows 98, ME, NT, 2000)
- Browser: Netscape 4.72 or Internet Explorer 5.0 or higher

Web Server

- Platform: Windows NT 4.0, Windows 2000 Server, IBM AIX, Sun Solaris, HP-UX
- Apache, Microsoft IIS, Jakarta Tomcat, BEA WebLogic

BizFlow Server

- Platform: Windows NT 4.0, Windows 2000 Server, IBM AIX, Sun Solaris, HP-UX

Database Server

- Platform: Windows NT 4.0, Windows 2000 Server, IBM AIX, Sun Solaris, HP-UX
- Database: Oracle 8.0.4, MS SQL Server 7.0 or MS SQL 2000

Standards Participation

HandySoft actively participates in both the WfMC and BPMI.org.

Case Study

Nong Shim, a food products company established in 1965, has 5,150 employees across Korea, U.S.A, Japan, and China. There are five factories in Korea and three factories in China, as well as one hundred sales and logistics offices across the world. Realizing that their many employees at diverse office locations needed a way to communicate and automate their business processes, they installed BizFlow. The goal of the BizFlow implementation was to improve the collaborative work process and to increase productivity in the area of new product development, claims management, and KOLAS (Korea Laboratory Accreditation Scheme).

Since the deployment of BizFlow, Nong Shim has seen several competitive advantages emerge. First, it has been able to develop new products faster than the competition and maintain higher quality levels. More efficient and effective product delivery has led to increased customer satisfaction and thus, increased market share. In fact, Nong Shim's market share has increased almost two full percentage points in the three years that BizFlow has been operational.

Nong Shim first established an enterprise information strategy plan to achieve management's goal of an "extended enterprise." NICE (New Nong Shim thru Innovation & Customer Satisfaction by Easy Information System) is the strategic information system built upon the umbrella of innovation and customer satisfaction using a workflow system.

The company realized it needed an integrated, centralized system based on functions such as product

development, operations, manufacturing, and logistics to improve its work process and increase productivity. The BizFlow product was brought in to do just that. This system has been applied to new product developments and claims management. Additionally, the workflow system has been extended to KOLAS which is an official recognition from the Korean government given to research facilities with international standards.

With BizFlow, Nong Shim has been able to streamline and automate the new product development process, which includes such functions as product adjustments, package design, and manufacturing/preparing of permitted materials. Nong Shim can now monitor the process to evaluate efficiency. In addition, the company was able to create a collaborative system that shares and distributes information between the three subsidiaries that work together, not to mention the in-house departments such as operations planning, manufacturing planning, product planning, product development, package development, quality assurance, manufacturing technology, and materials development.

Nong Shim also uses BizFlow for its claims management process. With the BizFlow product in place, feedback and processing time for quality management across five factories and dozens of operations branches has been shortened. Additionally, the company was able to remove redundant electronic documents creating a paperless office.

The company saw both quantitative and qualitative outcomes from the BizFlow implementation. From a quantitative perspective, Nong Shim has been able to shorten work processes through efficiency increases and elimination of redundancies between departments, and reduce the cost of paper distribution through the digitization of much information. From a qualitative standpoint, Nong Shim has been able to begin preparation of work standards (document format, business rules, etc.), set up the basic information to keep track of process history, and prepare the infrastructure for connecting all divisions for process interconnection.

HP: A BPM Summary Report

Overview

The HP Process Manager is a component of the HP Netaction Internet Operating Environment. The HP Netaction suite consists of other HP components: HP Web Services, HP Total e-Syndication, HP Mobile Portal Solution, and HP Developer Tools and Partner Solutions. The HP Netaction suite sits atop a J2EE application server and HP's management, security, infrastructure, and platform services.

The HP Process Manager provides an environment in which it is possible to create and deploy automated processes. It is a technology for both process management and integration. It aims to bring together people and applications, both inside and outside the organization.

There are several components of HP Process Manager:

- Process Definer—for modeling business processes
- Process Engine—for managing and executing processes
- Middleware-independent architecture—for integration with external business applications
- UI—connecting users through the Web
- Business Console—for the monitoring of and reporting on processes

The components of HP Process Manager work together to allow users to visually create and execute processes.

Recently (November, 2001), HP announced HP Process Manager, Interactive Edition. It is a J2EE-based environment where composite services and applications can be created from existing components and services. It is also possible to create device-independent user interactions. The Interactive Edition can also be OEMed to workflow vendors. The Interactive Edition is complementary to HP Process Manager as, between the two, they cover a broad range of BPM features.

Process Modeling

Allowing IT and business to work closely together without the miscommunications that usually occurs is a huge benefit. The Process Definer allows business

analysts to graphically design their processes. This way, business people can focus their energies on designing the process itself, without needed to know about the underlying technology, while IT simply implements and manages the software.

Creating an application- and middleware-independent process management environment is another benefit. This means that organizations can leverage their investments in existing infrastructure and avoid the cost of replacing long-lived legacy systems. HP Process Manager can utilize existing directory structures, as well.

Process Monitoring

The HP Process Manager includes a Business Console for monitoring business processes and their data. The Business Console can track individual processes, provide tabular or graphical reports on process metrics, and use third-party reporting tools to combine this process data with other business data. Thus, it is possible to continuously analyze processes in order to make improvements based on performance.

Process Operation Capabilities

Importantly, HP Process Manager separates business rules, services, and resources. Business rules provide the logic behind events, i.e. what dollar value purchase requires managerial approval. Services are business functions that are contained in software, such as delivery of goods to a customer. Resources execute the services within a process; resources can take the form of people, applications, or other processes.

A process binds underlying services together; each service can be reused in different processes. HP Process Manager's Resource Executive manages which resources will perform which service. A service can be provided by a user (utilizing a Web form, e-mail, or application), by a business application (utilizing an ODBC/JDBC or application adapter or applications directly connected to HP Process Manager), or by a sub-process within the larger process.

There is a process engine in HP Process Manager that provides end-to-end management of all processes once they have begun. This process engine controls the components of the HP Process Manager so that relevant resources are selected and the activities are delivered to the underlying services. It also ensures that all process events are recorded in audit databases for tracking purposes.

A key feature of HP Process Manager is the separation of business rules, services, and resources previously alluded to. Essentially, HP Process Manager separates business logic from application logic. This serves two purposes—first, it provides an environment in which business and IT can work with each other more fluidly; second, it allows processes to be application-independent, meaning they will work no matter how the organization's IT infrastructure changes.

HP Process Manager is scalable to thousands of users, supporting many Web-based Worklist Servers, each of which can be used by many people. The Worklist Server stores work items for users in work lists and provides the framework for supporting and managing many thousands of users. Reliability is ensured as HP Process Manager keeps a copy of every task it sends out.

Implementing a process using HP Process Manager occurs through several phases. First, the Process Definer is used to model the process. Processes consist of four nodes: start node, work node, route node, and completion node. The start node is for the definition of the input parameters to the process and makes sure that a process is started only by an authorized employee or application. Each work node represents a step in the process. The step is actually completed by a service (the service may be process-specific or used by many different processes). As mentioned previously, services may be executed either by a human or an application. Route nodes enforce the business rules associated with a process. The completion node signifies that a process has ended.

Once the process has been defined, it is stored in the process repository, which can handle issues such as process versioning. Here, any user forms within the process can be automatically generated as Web e-forms. Any defined process can either remain private or be exposed as an available service for immediate reuse as a sub-process within another process.

HP Process Manager strives to provide the ability to use and reuse common low-level business services, create reusable sub-processes, and combine these together in end-to-end business processes. It also has EAI capabilities—an important consideration. HP Process Manager can provide access to business data for use within a process, send data from one application to another, replicate common data between applications, link business transactions between multiple applications, offer alternative interfaces, i.e. web-based, to current applications, and link several

applications into one common interface. Applications adapters created with the HP Process Manager API, ODBC/JDBC adapters, and middleware adapters enable all this. If deeper EAI needs exist to, for example, lower-level data synchronization and data exchange, HP Process Manager can call on a number of ready-made middleware adapters of other EAI vendors, e.g. webMethods Enterprise, Tibco and BEA eLink, to fulfill this need.

Automation

Once the steps and logic of a process have been modeled using the Process Definer, HP Process Manager then validates the process. If validated, the process is deployed within the engine, where versions of it are stored as it evolves.

Steps of the process can be automated in several ways. When no manual steps are present, applications events can trigger processes, e.g. a CRM system can trigger an outbound e-mail marketing processes. Likewise, items from HP Process Manager can be sent back to the applications that support the process.

Automation can also be achieved through a custom client written using the HPPm API, e.g. a Java application or applet, a COM-based application, or Visual Basic for applications.

Should human employees be responsible for steps in the process, there are two ways automation can happen. First, proactive notifications can be sent to the worklist sever, which appears on the UI as a “to-do” list. Second, the e-mail plug-in capability can be utilized. In this scenario, the process item is delivered as an attachment on an e-mail. When the user opens the attachment, the work item is rendered; the user completes the item and sends it along, at which point it is delivered back into the process.

Integration

HP views Enterprise Application Integration (EAI) as a subset of BPM. HP Process Manager takes a process-driven approach to EAI. In fact, HP sees application integration (which typically involves only low-level data) as just one of the pieces of enterprise integration that needs to occur. People within an organization must also be integrated within a process because there will be a human component to virtually all processes. The HP Process Manager integrates both people and applications within a process.

Additionally, it integrates people and applications that may be outside of the organization, such as trading partners, suppliers, or even customers.

HP Process Manager is middleware independent, with prebuilt modules for WebMethods, BEA eLink, and Tibco.

Technology Platforms

HP Process Manager is available for Windows NT and 2000, HP-UX, and Solaris platforms; 8 and 16 bit data is supported for international use.

HP Process Manager V5.0 is a CORBA-based application that communicates with application servers through XML.

Standards Participation

HP is a member of BPMI.org.

Case Study

COLT is a telecommunications companies operating in Europe. Founded in 1992, COLT operates an integrated IP-based pan European network linking the financial and business centers of Europe and providing a full range of telecommunications services to both corporate and carrier customers.

COLT operates in 27 European cities in 10 countries and plans to provide service up to 32 European cities by the end of 2001. COLT is currently interlinking its city-based networks to create a truly pan-European network. Given the diversity of Europe, creating a pan European network means integrating the systems of many different cities. In fact, when COLT first began this undertaking, it was viewed as an EAI project only. Quickly, however, COLT realized that EAI only solves part of the problem, and that process management was needed.

COLT decided to use HP Process Manager for the order management and provisioning process for its DSL products. This gives COLT the ability to design processes in an easy to use interface. When designing processes with HP Process Manager, COLT will often have splits or sub-processes that need to be accounted for. HP Process Manager allows COLT employees to sure these process components will work in the context of the overall process.

COLT makes extensive use HP Process Manager's monitoring capabilities. By doing so, the company gets

not only real-time information about how the process is running, but also reports to use for such activities as benchmarking.

One of the most important aspects of process management for COLT was that processes be able to make use of the integration between COLT's applications. In fact, the infrastructure created by the deployment of HP Process Manager and WebMethods (for EAI) is the strategic platform for COLT going forward. The platform will be extended through the enterprise as "Info-Broker," and will provide employees with access to the information they need to complete processes in an efficient manner.

Optika: A BPM Summary Report

Overview

Optika helps companies to automate and enhance their business processes with its Acorde family of products. That family includes Acorde Process, Acorde Resolve, and Acorde Context. Acorde Process facilitates users' participation in processes, allowing internal and external participants to begin prioritized work tasks, receive status updates, or to change business processing requirements. Acorde Resolve gives companies collaborative tools that help to more quickly resolve transaction issues. Acorde Context provides the ability to capture, store, and manage the documents and data that are part of business transactions—giving the information a business context.

Process Modeling

In Acorde Process Builder, users have a graphical tool with which they can model and design processes. Leveraging the capabilities of Acorde Process Builder, users are able to define work processes, events, and tasks in order to automate content delivery and routing throughout the organization and over the Web with supply chain partners. Because the workflow process design of Acorde Process Builder is separate from the underlying client application, processes can be designed based on what works best for the organization. The upshot is that these processes will work with the company's applications no matter what the existing infrastructure base is.

Process Monitoring

Acorde Process Monitor provides a graphical, real-time reporting manager that presents pertinent information to those that need it. This ensures that managers can view the work being completed within processes that they are responsible for. Should the information indicate process issues, managers can take action such as load-balancing through dynamic reallocation of work. Acorde Process Monitor is the first step to process optimization.

Additionally, Acorde Process works together with another Optika product, Acorde Context, to deliver information to a user. Acorde Context captures the documents and data in business transactions, including scanned documents, reports and data from line-of-business applications, fax, email, HTML/XML

and EDI. The information from both Acorde Process Monitor and Acorde Context give users a holistic view of processes.

Process Operation Capabilities

Acorde Workplace is a component application of Acorde Process. The Workplace is a Web application that provides users secure access to documents and information necessary to completing their tasks. Acorde Workplace is customized by users—a user will see what their role allows them to see. Additionally, users are able to customize their interface, prioritizing what they want to see. The user interface, either client/server or Web-based, is a simple point-and-click environment where the user can customize the information they need.

Acorde Resolve is Optika's tool for delivering collaboration services for the purpose of resolving business transaction issues. Acorde Process works directly with Acorde Resolve to automatically identify problem transactions and present them to users. A problem transaction initiates the creation of an individual Resolution Pak—these Paks contain the relevant information about a transaction and the collaborative tools to solve it. At their core, Acorde Resolution Paks are individual collections of transaction data and supporting information, i.e. purchase orders, specifically related to transactions with issues. Once transaction issues are discovered, Acorde Resolution Paks are created and delivered to participants within the process for resolution.

Acorde Resolve enables companies to build Web resolution hubs, where users have access to all relevant transaction information as well as collaborative tools for real-time resolution. Essentially, an organization can create a secure office environment for their own employees and supply chain partners to cooperatively solve transaction issues. The collaborative tools include real-time discussion, review, and resolution of transaction-related information.

One of the collaborative tools offered by Acorde is co-browsing. In this situation, users can actually drive transaction content being viewed by others on a Web resolution hub. With interactive chat, users can leverage real-time interactive text-based communication while viewing the same transaction content. The Discussion tool allows users to communicate with other users about specific transaction issues via messages within Resolution Paks.

The system allows users to access information about trading partner community participants, such as purchasing agents, by their preferred method of contact and availability via Electronic Member Lists. Users can bookmark information that they intend to use in the future and deliver transaction data via e-mail to trading partners, using secured links stored in the email messages. And finally, Acorde Resolve provides a tool for fax output/input of content on Web resolution hubs that enables participants that do not have Web access to continue to work in their own environment.

Automation

Acorde enables business process automation by allowing the graphical design of business processes, providing a flexible presentation layer, and enabling integration with 3rd party applications so that information can be exchanged between systems. Additionally, process administrators can use the Acorde monitoring tools to identify bottlenecks within the system in order to make modifications to live processes.

Optika provides the ability to build customized views into processes through My Acorde. In this way, it is possible to automate processes with manual steps—ones that involve humans more than others. My Acorde allows users to create an interface to the process that supports their unique way of working—through the administration of saved searches, specialized workflow profiles and links to their commonly-accessed Web sites.

Integration

Through Acorde Integration Tools, a company can integrate its application environments (i.e. ERP and CRM) to its business processes while keeping the logic behind both separate. This is important because the processes to run no matter what application infrastructure is in place. Optika specializes in working with ERP packages, though it can work with any line-of-business application.

Often users need access to data that exists in separate applications. The Acorde Client addresses this need. Acorde Client is an application that captures and secures transaction data, regardless of its origin or location, and presents it in a single user interface. Also, Acorde Context gives users, whether in-house or remote, a single point of access to transaction data from a variety of client desktops. And, the Acorde XML

Gateway is built on webMethods B2Bi, facilitating the automation and delivery of diverse transaction content to and from Acorde Resolve.

Acorde Storage Service allows companies to store business content from a wide variety of disparate sources. This service migrates, stores, and protects the transaction data created in the organization, building a repository for business content that is accessible over the Web.

The goal of Acorde Integration Tools is to extend, leverage, and integrate enterprise systems with Acorde's imaging, workflow, and collaboration functionality. Thus, companies are able to add process control and document access capabilities to their processes. ERP systems effectively handle back-office functions such as accounting and database reporting, but companies must be able to manage entire transactions and effectively access and interact with supporting data and documents. With Acorde Integration Tools, users can capture, store, and retrieve critical transaction information while dynamically managing the entire range of back-office processes from a single desktop.

Technology Platforms

Acorde Process is built on an n-tier architecture and is Microsoft-compliant, using COM.

Standards Participation

Optika is not involved with standards organizations at this time.

Case Study

Pepperdine University is an independent, private university located in Malibu, California. The University has an enrollment of approximately 8,000 full-time and part-time students in its five colleges and schools. With that many students spread across five academic divisions, it is easy to imagine that the admissions process can be difficult to manage. Pepperdine brought in the Acorde product from Optika to manage the admissions process.

The admissions process has several documents associated with it, including the applications itself and supporting documents such as recommendations, standardized test scores, and transcripts. So much paperwork can lead to confusion over what belongs to

whom and which applications are actually complete. When Acorde was first brought in two years ago, it served more as a general archiving, or imaging, tool for storage and retrieval of documents.

Since that time, Pepperdine has evolved the uses of Acorde within the admissions process. Now with Acorde, Pepperdine's admissions department is able to capture, manage, store, and route external and internal application documents, while, at the same time, matching records within the University's line-of-business student marketing application. To manage the process, Acorde is being used to automate the "match and update" function of documents to applicant records, provide a look-up form to match documents to a record when automated lookup is not possible, streamline the updating of application requirements into the line-of-business student marketing system, and automatically import and route on-line applications in a PDF format.

Pepperdine has benefited from improved productivity, but that's not all. Now that applicants can apply online, they become an extensible part of the process. The improved process efficiency in the admissions process can't help but make an impression on the student community. In the near future, Pepperdine plans to utilize Acorde to migrate records for admitted students to the Registrar's records as well as use Acorde to manage the applicant evaluation processes.

This is a good example of how a BPM tool can help to improve processes that are document-heavy and involve many manual steps. The admissions process will never be fully automated because a human's judgement will always be needed for a decision. However, Acorde is able to save time and money within the process by driving it and managing the documents and information associated with it.

Q-Link: A BPM Summary Report

Overview

The Q-Link Business Process Management product addresses modeling, automating, integrating and managing enterprise business process applications. Q-Link unifies the core components of business processes—people, workflow and data—without requiring the retooling, recoding, or replacing of any underlying enterprise software. The goal is to compress application development cycles and accelerate time to market, leading to improved performance and efficiency.

Process Modeling

The Q-Link Process Development Workbench provides process modeling and design capabilities for both business users and IT Professionals. The Q-Link Process Application Designer (PAD) is a graphical development tool that enables business users to build and deploy complete Web-enabled process applications without any programming. Using the PAD, Business Professionals define and organize all process assets including process data, user interface/forms, business rules/workflow, and defined integration points. In addition, business users can use the PAD to dynamically update any process element in run-time.

The Q-Link Process Development Workbench provides process modeling and design tools for the IT Professional. The Q-Link UI Designer is used to develop, customize, and extend all aspects of the Web client interface. With Q-Link, developers can create and modify pages, views, and handlers to tailor and customize the user interface meeting the exact requirements of any process. The Q-Link UI Designer provides a centralized Integrated Development Environment (IDE) for accessing and customizing every page within the Q-Link system from user log-in to work queues and reporting. In addition, the UI Designer enables personalization for creating specific views that provide formatting and accessibility options for each individual user or group within the system. The UI designer is used to extend Q-Link BPM functionality into existing applications, portal environments, and B2B processes, extending automated processes beyond the firewall.

The Q-Link Object Definition Editor is a platform-independent data definition tool that allows IT Professionals to extend the Q-Link data model to create tables to use within automated processes. For example, data tables such as customer master records, product SKUs, or sales territories can be created to drive business rules and actions.

Process Monitoring

Q-Link allows the real-time management of processes and provides dashboard reporting capability to drive ongoing process optimization.

Users receive work assignments via a Web-based inbox accessible from any Web browser or wireless device. Alerts, escalations, and notifications generation can occur at any step in the process to support business requirements. A workload balancing capability automatically determines the optimal route for transactions based on a user's skills, existing workload, and historical performance for similar requests. This functionality aims to allow real-time workforce management and optimization across the enterprise.

Q-Link also stores all process data and process states to provide detailed analytics for managing personnel productivity, process performance, and business cycle times. Business metrics available in Q-Link include team and individual performance measurements, process quality and root cause analysis, and end-to-end and sub-process cycle times. Armed with such metrics, managers can begin to improve process performance and work to optimize all processes.

Process Operation Capabilities

Q-Link's workflow Process Engine is the run-time environment executing the business rules and controlling the end-to-end movement of all process information. At any step in the process, Q-Link routes work to any user or external system based on the defined workflow. Q-Link supports complex process requirements including splits and joins, conditional paths, sub-processes, and exception handling. To ensure business responsiveness and flexibility, Q-Link enables run-time changes to the process.

The Q-Link Process Engine also provides versioning and change management capability. This functionality enables workflow changes to be developed and tested

using the Q-Link design tools and then executed at a future date. Since every executed process instance is correlated to the specific workflow version that was used, managers can compare process performance over time and identify the impact of process changes.

Integration

Q-Link's Process Action Components (Q-PACs) allow integration with any existing enterprise application by separating the process logic and integration points from the underlying system logic. This process-level integration creates an environment where business rules and workflow can be modified without requiring the retooling, recoding, or replacing of any existing enterprise software. Q-Link allows organizations to create reusable components that define a distinct action such as retrieving or writing data through a published API, sending an e-mail, routing work to a user, or initiating a Web Service. Once a Q-PAC is created, it is represented as a unique icon within the workflow design tool and can be incorporated into any process by business professionals. This approach frees business professionals from technology complexities enabling them to focus on process design and optimization, while software engineers concentrate on core technology and integration issues.

Technology Platforms

Q-Link is J2EE compliant.

Q-Link is compatible with the following Application Servers, Database Platforms and Operating Systems:

App Servers: IPlanet, BEA, WebSphere, JBoss, JRUN, Apache
 Database Platforms: SQL Server, Oracle, DB2, Sybase
 OS: NT, Unix, Win 3.1

Standards Participation

Q-Link is currently investigating participation in the WfMC.

Case Study

Mergers and acquisitions often shine a spotlight on BPM and integration. When two large global manufacturing firms with combined revenues in excess of \$20 billion and over 30,000 employees were

executing plans to complete a merger, it became clear that a BPM solution would be necessary. Combining the two organizations, each with unique processes, cultures, and technologies would pose a great challenge. Additionally, the new organization struggled with how to maintain customer loyalty while undergoing such an extensive organizational change in a highly competitive market.

With the merger, there were several business risks. There was the potential to lose customer transactions as inevitable employee turnover occurred—making it difficult to track every customer interaction and ensure that it was completed. It was also possible for employee skill and process knowledge to disappear as two cultures collided. Additionally, there was the risk that customers could experience significant delays in obtaining resolution to requests, as the merging of two processes created bumps in the road. Process management in general would pose a great challenge and it would require at least 9 months just to effectively merge the ERP infrastructures of both firms. What all of this meant was that, despite the synergies that led to the merger, the expected gains could be overshadowed by deteriorating financial results and reduced customer satisfaction.

In an effort to mitigate these risks, the newly combined company deployed Q-Link. Q-Link's intuitive design facilitated the automation of mission critical business processes within weeks. Q-Link helped to eliminate the process gaps created in the newly formed enterprise and enabled the organization to accurately track and manage every transaction from receipt to completion. By automatically routing work requests to the appropriate individuals, Q-Link created 100% accountability within the process in an effort to prevent delays and errors from ever occurring. In addition, Q-Link's reporting enabled managers to monitor process backlogs and performance through each and every phase of the merger integration to ensure service levels were being achieved.

The results: the new organization completed the merger while simultaneously increasing the levels of customer satisfaction and process performance. Overall cycle times decreased by over 60%, employee productivity increased by over 45%, and process improvements directly resulting from Q-Link saved over \$2,000,000 in the first year.

Peregrine: A BPM Summary Report

Overview

Peregrine's Business Integration Suite (BIS) is an integration platform with a single architecture approach for both Enterprise Application Integration and Business Process Management. BIS is built around a single-state-management process engine with a standards-based foundation. Peregrine's roots are in B2B Relationship Management (B2BRM), or managing processes and integration between companies; now, their capabilities are just as suited to internal process integration or application integration.

The BIS is made up of the following components:

- Alliance Manager—an integrated development environment for graphically modeling inter-company business processes and defining business objects
- Power.Enterprise!—data transformation software that addresses the data conversion and integration needs of companies seeking to use e-business
- Integration Adapters—communication mechanisms that allow companies to integrate complex business processes between applications, company divisions, and external entities
- Process Paks—packaged business process products, delivering best-practice B2B processes
- Partner Channels—support the flow of information associated with business processes through the establishment of physical communication links with trading partners

Process Modeling

The Alliance Manager is a software server that supports the design and execution of business processes. It manages the back-end systems and coordinates interactions with external organizations. The Alliance Manager provides a management environment for real-time visibility and control over the flow of information and the execution of business processes among groups of businesses and their existing IT systems.

Business processes can be defined by business analysts without the need for them to learn any detailed programming. The graphical process modeler has an intuitive interface for rapidly designing, testing, and deploying business processes.

Process Monitoring

Peregrine provides a database to log all message interactions ensuring greater visibility of interactions between trading partners and real-time monitoring and analysis. Real-time information from monitoring can give a manager the information necessary to load-balance or to modify processes.

BIS supports time-outs, exception notification, automated restart, automated checkpointing, network management integration (through SNMP), auditing, reporting (published database schema for SQL-based queries), and static load balancing.

Process Operation Capabilities

To understand how Peregrine's BIS does its job, it is useful to look at the Process Paks module. Process Paks are essentially packaged processes, or templates, designed to allow rapid deployment of best-practice processes with business partners. Users can modify and customize the Process Paks, working in their drag-and-drop environment to create the processes that are right for their enterprise. Peregrine currently has Process Paks for e-retailers, logistics services, Net markets, RosettaNet, and semiconductors.

As an example of what a Process Pak can do for an enterprise, take the RosettaNet Process Pak. Included in the it are all Partner Interface Process (PIP) specifications (and associated XML data definitions) that have been published to date by the RosettaNet organization. This allows an organization to make a RosettaNet-compatible process deployment virtually plug-and-play.

Because processes have a tendency to change and evolve over time, it is crucial that a BPM tool provide maintainability. To respond to this requirement, Peregrine offers built-in version and change management of processes. Peregrine also provides integrated metadata management by storing

information in industry-standard relational databases versus a file system.

Automation

Peregrine's BIS was architected to provide rapid automation of business processes, both internally and externally, including the integration of all applications.

Peregrine's transaction processing engine provides for automatic checkpointing and restart. Industry standard RDBMSs are used for state management and enable native support for checkpointing and restart and recovery.

B2Bi Integration Manager automates processes by allowing business users to graphically describe their interactions with external trading partners and internal enterprise systems and the business logic that ties them together. B2Bi takes this graphical description and manages the execution of business data through the process flow. By allowing flexible and complex process descriptions, any internal or external business process can be automated with B2Bi.

Integration

Peregrine approaches BPM from an integration angle. Peregrine's wizard-based Integration Adapters provide an opportunity to efficiently integrate some of the more commonly used applications. The Integration Adapters allow users to integrate packaged, custom-developed database and legacy applications faster than would be possible through traditional integration. The Integration Adapters are created using a flexible architecture with point-and-click functionality. They are 100% Java based and natively support XML. Peregrine's Integration Adapters have been used to integrate such applications as BEA Weblogic, Clarify, Manugistics, PeopleSoft, and Vantive.

The Power.Enterprise! module of BIS allows a company to interact with other e-business participants in its value chain. It features any-to-any data conversion capabilities that span existing and new e-business technologies (meaning infrastructure can adapt to varying participant requirements). And, with real-time, persistent request/response processing, mission-critical transactions are exchanged faster than ever before.

The BIS provides real-time systems and transaction management information so that an accurate record of all enterprise e-business traffic is kept. BIS features a mapping tool with wizards and drag-and-drop functionality for quick mapping. A user can create simple mapping rules for elementary conversions, or use formulas or JavaScript for more complex and sophisticated conversions.

The BIS has a native Get2Connect channel built-in. Get2Connect is Peregrine's global trading network. This connection provides access to the e-business center's comprehensive customer self-service capabilities. When users log into Get2Connect, they can track documents and update account information among other things.

In order to allow the flow of information necessary to sustain business processes with external entities, companies need physical communication links with partners. Peregrine's Partner Channels support several integrated communication channels, giving companies the ability to support the right type of communication channels based on their needs. The right communication channel can be based on a number of parameters, including timing requirements, data content, and level of collaboration required with the trading partner.

When a step in a defined process calls for the exchange of data, it determines the specific Partner Channel to use. This abstraction lets users design business processes without regard to communication constraints. Thus, rather than constructing separate processes based on the communication method, you can build a single process that accommodates multiple partners, even if they are using different communication types. A partial list of the communication types supported by Partner Channels includes: XML over HTTPS, SMTP, RosettaNet, CIDX, FTP, EDI, and HTML via a browser.

Additionally, Peregrine is positioned to deliver Web Services through its ability to communicate with SOAP-rendered services. This applies to both internal communications (via adapters) and external communications (via Partner Channels).

Technology Platforms

Core process engine is developed on a standards-based foundation—XML and Java and J2EE.

Standards Participation

Peregrine offers a standards-based foundation - XML and Java (plus MQ/JMS) and J2EE directions.

Case Study

Sharp Microelectronics of the Americas (SMA) produces discrete electronic components for Sharp Corporation's factories in the Far East. Currently, there is stiff competition in the electronic component marketplace. SMA has traditionally relied on its parent company's, Sharp Electronics, legacy systems for supply chain management. Given the competitive pressures, SMA has realized that it needs to begin utilizing e-business to transform both its internal operations and its customer-facing business processes.

SMA is focusing on the flow of information between the factories that manufacture electronic components and the sales and distribution processes that help employees to promise shipments and ensure delivery.

SMA is creating a Web-based portal that employees can use to access a suite of applications. The portal brings together information from multiple sources, organized around business roles and tasks. Peregrine plays a crucial role in the technical architecture through its EAI system for business process management.

Key to making everything work smoothly at SMA is Peregrine and its B2Bi product to allow the exchange of content between disparate business applications. The e-business team at SMA is using Peregrine's B2Bi for dual purposes: supporting sales and distribution processes and creating direct company-to-company connections. To support sales and distribution processes, Peregrine enables such activities as integrating point-of-sale information from distributors directly into the SMA environment. To help create direct company-to-company connections, Peregrine allows electronic linking with business partners using RosettaNet partner interface processes, EDI, e-mail messaging, or simple file transfers.

For SMA, what Peregrine's B2Bi provides is the electronic workflow and the business transaction flow that is generated on the front-end by customer-facing applications. Thus, there is a flexible environment in which the company can address multiple business problems. SMA can consolidate data from distributors immediately, whereas it used to take days. Business managers can also use this framework to collect and distribute sales leads—direct revenue growth opportunities. And, the entire order management system can now be Web-enabled as enterprise systems are connected.

Staffware: A BPM Summary Report

Overview

The Staffware Process Suite is a multi-component suite of application modules designed to provide process integration. Organizations can create an IT infrastructure based on their own unique processes.

The Staffware Process Suite was designed with people in mind—people do business with people; people design and execute a company's business processes. These processes, in turn, represent the company's differentiating factors within the marketplace. The Staffware Process Suite uses a company's business processes as the process integration roadmap for integrating underlying applications and data infrastructure.

In implementing a BPM integration solution, process applications are implemented a layer above the application infrastructure. The applications can be distributed across the network, and just as processes can be sub-divided to encompass additional business requirements, process applications can be deployed within the context of these additional sub-processes. The Staffware Process Suite provides a high level of intra-enterprise and inter-enterprise integration.

Process Modeling

Staffware aims to ensure that the people who are intimately involved in managing operations work alongside IT staff in using the Process Definer tool. Here, the mapping of all business processes occurs. A user can model processes using the Staffware Process Definer (SPD). The Process Definer is a graphical modeling environment utilizing drag and drop technology. It can be used by both developers and business analysts—those that manage the processes can create them.

The Staffware Process Definer provides several mechanisms to enhance the overall process integration solution. A user can set deadlines, time-based design constructs that become step elements to improve the overall process automation. Period deadlines specify a time period before invoking a deadline while expression deadlines dynamically define a deadline at run-time.

Users can also manage the routing of the process logic through routing, branching, conditions, parallelism, and complex routers. These capabilities give an organization the ability to create a dynamic process integration schema based on its own unique processes. As a special type of routing construct, waits provide a point of coordination for multiple parallel business processes.

Additionally, templates are available for given verticals. These templates provide users with best practice processes out-of-the-box, which can speed process deployment.

Process Monitoring

The Staffware Process Suite has two process management tools: Staffware Process Administrator (SPA) and Staffware Process Monitor (SPM). SPA establishes and manages the users of the system. This tool provides role management—the ability to define several levels of users from work groups, supervisors and individual users. The Administrator performs such tasks as backups (system-wide down to individual procedures), ad hoc rerouting of process case data, and changing procedure definitions in real time without impacting the underlying process execution.

The Staffware Process Monitor (SPM) provides insight for business analysts and users by allowing them to proactively manage their business processes. Using a graphical interface, the SPM monitors processes and provides performance metrics and status reports on full business processes. The Staffware Work-In-Progress Manager (SWIP) provides reports and audits on specific case data and queue status. SPM can determine and analyze business performance data across organizations and across systems in an intuitive fashion, supporting decision-making for process optimization. Information about process performance is gathered from the data within the Staffware Process Engine databases that result from process execution.

Process Operation Capabilities

This primary layer of the Process Suite architecture is comprised of the Staffware Process Engine and the Staffware iProcess Engine. These engines are the heart of the Staffware Process Suite because this is where business processes are automated, implemented, and

executed. The choice of whether to use the Staffware Process Engine or the iProcess Engine will depend on the volume of transactions that will need to be processed and the amount of human intervention that will be necessary.

The Staffware Process Engine has some additional features beyond its predecessor, Staffware 2000. For example, there is enhanced directory management capabilities to simplify the administration of BPM. Through its LDAP integration capabilities, Staffware Process Engine now enables its customers to administer their users via a centralized directory service such as X.500 or Active Directory. Through the use of a rules based system Staffware is able to import the most up to date Staffware user information from a directory service.

The Staffware iProcess Engine has inherited many of the capabilities of the Process Engine. However, it has been designed for large multinational organizations that require a high performance, high volume transaction processing solution. The iProcess Engine supports faster transactional processing through its EAI Step technology.

All elements of Staffware iPE have been tuned for performance: it has been designed to manage very high volumes, has near-zero latency when using EAI Steps, and can scale linearly across multiple nodes. It also provides fully automated sub-processes to further enhance its STP capabilities.

The architecture of Staffware iPE provides for comprehensive rollback and recovery in the event of hardware or software failure. Updates to internal and external resources can be wrapped within a single Staffware transaction. All the updates can then be committed using atomic two-phase protocol. In the event of any failure, all data can be rolled back to a consistent, known state.

Integration

The Staffware Process Integrator is a new module that incorporates Staffware's Integration Broker technology, a Process Integration Library, and the Actional Control Broker for Staffware (ACBS) to provide a set of enterprise application adapters. This approach facilitates integration with legacy and packaged applications directly from a defined process.

The Control Broker approach is significantly different from middleware, where channels of communication must be set up and programmed, and interfaces to accommodate incoming and outgoing message streams need to be implemented.

In contrast, the direct, lightweight Control Broker connection has significant benefits: first, it reduces the amount of integration and configuration of applications. Second, because of the lack of a mediation layer, performance is visibly improved, and reliability, robustness, and security are now dictated by the capacities of the linked applications.

Staffware Brokers provide an additional level of process automation and integration. Brokers support development in CORBA, COM, Java, RPC and WAP and are able to take full advantage of work queue and group work queues for expedient transaction processing, both synchronous and asynchronous processing. Staffware Brokers are scalable in that they are loaded only once so that they do not continually consume valuable computing resources.

Leveraging key technology such as distributed processing across multiple nodes, process-driven application integration, and synchronous processing through multiple steps, Staffware iPE can automate transactions—otherwise known as Straight-Through Processing (STP). This can speed up cycle times, improve processing consistency, and allow Staffware to offer a scalable BPM solution.

Additionally, the Process Engines are also integrated into Staffware's Relationship Management framework for integrating customers, suppliers, and partners into corporate business processes. This functionality is important in today's global marketplace.

Staffware Process Relationship Manager (SRM) supports process automation through its business components which combine data definitions, presentation layer and business logic. These business components relate to specific business activities and can be built to fit any business process. The SRM approach provides a flexible environment for managing all of an enterprise's relationships from customers and employees to partners and suppliers.

SRM is both a client/server Relationship Management (RM) system that has been written in Visual Basic and

C++, and a web server RM system (i.e. thin client) completely developed in Java. It is a solid toolset of object components for building RM applications using the Rapid Design and Build features, based on rapid application development (RAD) methodology. In building the application business logic, SRM supports its own scripting language, which can be enhanced by using VBA or COM; in the thin client version, JavaScript or VBScript are used to build the business logic. SRM gives customers the ability to further customize their applications by accessing the RAD tool.

Technology Platforms

The Staffware Process Suite supports COM/DCOM, CORBA, and J2EE.

Standards Participation

Staffware helped to found the WfMC, an organization that promotes and develops the use of workflow through the establishment of standards for software terminology, interoperability, and connectivity between workflow products. Staffware is also a member of BPMi.org, which seeks to standardize the management of business processes that span multiple applications, corporate departments, and business partners, behind the firewall and over the Internet.

Case Study

The Allianz Group is a company focusing on insurance, private provision, and asset management. The insurance group of Allianz had been using a workflow software to facilitate a single-step process of transferring posts from the scanned area to a team area. While the workflow tool did help in getting the scanned document from one area to the next, it was not driving the process.

Allianz first brought in Staffware to replace the workflow tool for the single-step process. However, it was not long before they realized the value of using Staffware on multi-step processes. The first multi-step process to be run by Staffware was the claims process, in which insurance claim information is scanned for entry into legacy systems and then faxed out to claims adjusters. This process was a manual one that required dedicated staff to take the information, then scan it into the system and fax it out. With Staffware, Allianz was able to automate input of claims information into

its content management system and auto-fax details to claims adjusters. The automation eliminates headcount cost and has reduced the overall time it takes to execute this process.

The success of Staffware in the claims process has led to a pilot project that is now underway. Allianz is using Staffware to have claims initiated over the Web. Essentially, insurance partners will be able to key in a claim over the Web and release the info into Allianz's system, where it will then go through the claims process. That claims process will be automatically invoked by the event of a partner initiating a claim.

There are several features of the Staffware product that Allianz has found particularly useful. First, the ability to change processes on the fly comes in handy, especially when testing processes before they go live. Second, many of the processes created at Allianz either have sub-processes or affect many other processes; thus, Allianz gets great benefit from the ability to create reusable process components. Also, Staffware updates legacy systems automatically, eliminating an otherwise manual step for Allianz. And, escalations based on time parameters helps Allianz keep up with their processes in an environment where time is of the essence. Additionally, building the rules for exception handling has been easier than expected, meaning that Allianz can continue to build more and more business rules into processes as time goes on. Finally, Allianz has been impressed not only with what kind of reports they can get out of the system, but how quickly they can build, request, and receive those reports.

BPM tools can profoundly affect even the smallest of processes. Allianz and Staffware together present a good example of how to start small and build upon progressively larger successes.

Sterling Commerce: A BPM Summary Report

Overview

Sterling Commerce, a wholly owned subsidiary of SBC Communications, Inc. is a worldwide business-to-business commerce provider. For over 25 years, Sterling has helped its Global 2000 customers improve process efficiencies, allowing them to reduce costs, increase profits and improve customer satisfaction. Sterling provides the software, services and expertise required to automate process flows between business systems within the organization, as well as with those of their diverse communities of customers, suppliers and other business partners.

The roots of Sterling Commerce trace back to 1975 as they pioneered in EDI (Electronic Data Interchange) technology—driving the standards used to automate and electronically exchange business documents such as purchase orders and invoices. Over the next 20 years, Sterling grew to become one of the world's largest independent providers of business-to-business commerce software and services for customers in industries such as consumer packaged goods, retail, manufacturing, healthcare, banking and financial services, energy, and telecommunications.

The evolution of the Internet brought new technologies, business models, and opportunities. And, just like 20 years prior, Sterling once again was in the mix – driving the adoption of new technologies. Today, Sterling strengthens a portfolio of software and services by providing legacy to Internet integration capabilities for maximizing process efficiencies—reducing the cost of implementation.

Sterling Commerce's newest business-to-business commerce software offering, STERLING Integrator, is an advanced, standards-based integration solution, offering a unified architecture for integrating internal applications, external partner processes and data, industry exchanges, and human processes to achieve new business value propositions. Along with integrated EDI support, STERLING Integrator provides a Business Process Management framework for deploying key XML standards, such as Web Services and ebXML.

Built from the ground up on J2EE (Java 2 Enterprise Edition), STERLING Integrator employs a service-oriented architecture. It is the first product of its kind to leverage the new BPML standard, along with integrated support for EDI and XML translation and business sequencing, Internet B2B protocols, Web Services, and internal application adapters. The modeling engine also enables human processes to be incorporated into business processes, thereby enabling organizations to achieve end-to-end process management—a key requirement for eliminating manual rekeying of data and accelerating information flows.

As a unified standards-based integration platform, businesses can enjoy simplified management of their processes, spend less time training staff, and streamline integration with their trading partners. With its BPM-centric approach, STERLING Integrator offers users a consistent framework and deployment methodology for solving a wide range of business problems that require integration. Through its integrated EDI and XML support, businesses can safely transition to new XML-based technologies and standards as they are developed and adopted.

Long-term technology trends driving the integration market include the evolution from batch file-based processing to business event-driven, real-time message-based processing; from business document centric to business process-centric; from EDI text to XML text; from legacy communication protocols to Internet communication protocols; and from limited integration with internal systems to extensive integration with internal systems. Coming to the market with a process-centric approach to integration, Sterling Commerce is utilizing STERLING Integrator to more holistically address BPM and provide an enterprise class environment for incorporating Web Services as a key business integration technology.

Process Modeling

STERLING Integrator implements integration scenarios as modeled business processes. At their core, business processes are really ordered sequences of services (activities within a business process). The purpose of a service is to achieve some pre-defined type of integration activity, such as communicating

with external applications via adapters, performing data manipulations, or spawning a pre-defined business process (nested process). Overall, STERLING Integrator includes approximately 80 different services, some internal, while others are external and configurable.

A graphical business process modeler enables personnel to visually design business processes that involve interactions among software applications, business exchange protocols, and people. The process modeling tool uses a familiar flowcharting paradigm; business analysts pick from a palette of icons that represent integration operations to be performed in a specific sequence. Icons represent such things as application adapters, flow control, data translation, and already defined business processes (since STERLING Integrator supports nested processes). The process modeler generates BPML source code, and experienced programmers can inspect and modify the BPML source if needed.

Formal change and version management features simplify prototyping and test-to-production migration.

Many business pains today can be traced to a lack of integration between automated processes and related manual human processes. These integration “breakdowns” create the need for manual rekeying of data, which causes data inconsistencies, errors, delays in business data processing, and inefficiencies. To provide “closed loop” end-to-end process management, STERLING Integrator enables humans to participate in managed business processes through a collection of services, tools, and utilities called Web Extensions.

Web Extensions enables humans to interact with data flowing through a business process through three mechanisms: querying, binding, and rendering. Web Extensions can be deployed to pause a business process until a human user performs a designated action (as defined by a configured Human Interaction Service), such as an approval process. The Web Extensions option supports data mining and user presentation through the chained use of three STERLING Integrator services: Human Interaction Service, the Human Interaction Query Service, and the Human Interaction XForms Service. The Human Interaction XForms Service employs the W3C XFORMS standard for rendering mined business process data on

a variety of platforms, including desktop computers, handheld devices, information appliances, and even paper. The STERLING Integrator Web Extension services normally interact with the HTTP transport services provided in the base STERLING Integrator product.

Process Monitoring

Tracking and monitoring services examine the flow of information as a business process executes. A browser-based user interface enables authorized personnel to inspect the workload on the system at any point in time. General views of the running system are available as well as detailed drill-down on specific business processes.

Process Operation Capabilities

To facilitate auditing, problem diagnosis, and full recoverability, STERLING Integrator persists both process state information and associated objects as they pass through a business process. STERLING Integrator maintains an internal data structure called the workflow context (WFC) for each executing business process instance. The WFC is an internal data structure, saved in the STERLING Integrator database, which defines the state of an executing business process.

STERLING Integrator supports parallel processes through support of the BPML <all> construct and sub-processes through support of the BPML <spawn> construct. A join can be specified to enable multiple threads of execution to wait until completion before the next step in the process starts.

Long-lived processes are supported through efficient memory management and persistence of process state and associated objects. Versioning of components such as adapters, translation maps, and business processes enables an already running long-lived process to execute to completion based on its starting version of maps or adapters, etc. Authorized users can use the administrator user interface to stop, suspend, or resume processes at the last completed step. The interface allows fine grain operational control over the run-time environment; for example, the ability to suspend or resume all instances of a particular business process or all business processes that employ a particular adapter.

Automation

The Business Process Engine architecture currently supports BPML and implements a lower-level representation of the business model layer for execution purposes. This allows STERLING Integrator to potentially support additional modeling languages in the future, such as WSFL, ebXML, or XLANG. The Business Process Engine invokes service, checks return values, and determines the next service to call. These services can range from security services to B2B communication services to translation services—the Process Engine automatically invokes the service that is needed. Additionally, the Business Process Engine persists state and data between service calls.

Integration

Integration is moving up the food chain into more complex automated processes—one of the reasons behind the drive to the use of BPM products. STERLING Integrator is designed to answer the need for deployment of simple or complex B2B and/or EAI to achieve automated business processes.

To support the exchange of data from disparate sources, STERLING Integrator additionally includes an industry leading translation capability based on its popular GENTRAN product. Data translation and transformation via two components: the Map Editor and the Translation Service. Using the Map Editor, a user defines data translation/transformation maps, which are then compiled for run-time use. At run time, the STERLING Integration Translation Service executes a specific map against a document and produces a resulting output document.

STERLING Integrator supports multiple styles of integration—optimized for real-time information exchange between applications and enterprises, but also supporting scheduled file-based integration.

STERLING Integrator provides several categories of adapters, which are treated as a complex type of service within the product's service-oriented architecture. Adapters interact with the world outside of the STERLING Integrator J2EE EJB “container” environment. STERLING Integrator implements a modular architecture that packages a set of optional B2B integration components as the B2B Services Option. The B2B Services Option manages the exchange

of data through the corporate firewall to external partners or applications being integrated via Internet protocols. STERLING Integrator implements B2B protocol standards for transport, security, document enveloping, documents, business process, and trading partner profile management. The J2EE-based component architecture enables STERLING Integrator to support concurrent use of multiple current and emerging standards such as ebXML, EDIINT AS1/AS2, BizTalk, RosettaNet, EDI, and custom XML exchange—all within a single business process.

Enterprise application adapters support key packaged business applications including market leading ERP, CRM, supply chain management, and procurement software. Communication adapters support key communication protocols such as FTP and HTTP. Technology adapters provide integration with databases and messaging middleware such as IBM MQSeries. An adapter development kit allows customers and partners to use common programming languages and component environments to develop custom integration adapters. Connectivity to sterlingcommerce.net and EDI-to-XML bridging is built into STERLING Integrator Organizations can use these capabilities to instantly tap into an e-business community with more than 300,000 active trading partners.

STERLING Integrator's service-oriented architecture and BPM-centric approach is ideally suited for Web Services. Currently, STERLING Integrator supports Web Services in two ways. First, Web Services can be invoked as a step in a business process. Second, a STERLING Integrator business process can be invoked as a Web Service.

Technology Platforms

A J2EE base enables STERLING Integrator to focus on the higher order value-add features required for modern integration scenarios. STERLING Integrator can leverage key assets of the J2EE platform such as the EJB component model, the JMS messaging interface, the J2EE security framework, and inherent cross-CPU scaling and load balancing. Leverage of these assets enables Sterling Commerce to focus on key integration software requirements such as data translation and transformation, security, authentication, the business process modeling and

management layer, transaction integrity, and adapter interfacing.

Standards Participation

STERLING Integrator is an open platform that can embrace the coordinated use of past, existing and future interoperable technology standards such as EDI, Web Services, ebXML, BPML and emerging XML-based security and quality of service specifications. By building STERLING Integrator on evolving open standards such as J2EE, BPML, XML and Internet B2B standards such as ebXML, STERLING Integrator is poised for optimal collaboration. STERLING Integrator exploits standards in all layers of its architecture. In the upper modeling layer: BPML (XML-based meta language) and XPATH. In the integration layer: XML, EDI, B2B protocols (ebXML, EDIINT), Internet transports (HTTP, SMTP, FTP), SOAP, UDDI, SSL, MIME, XPATH. And, in the low-level infrastructure base: J2EE infrastructure (JMS, JNDI, JDBC RMI, EJB component model).

Sterling Commerce participates in several ebXML OASIS Technical Committees, developed proof of concepts for the ebXML Messaging Service and Registry, and has participated in the first round of ebXML interoperability testing sponsored by the Drummond Group. Sterling Commerce is also helping to drive the development of the BPML specification through representation on the Board of Directors of BPMI.org.

Case Study

STERLING Integrator is a relatively new product. Therefore, most implementations are in the infancy stage. It is interesting to note the type of implementations STERLING Integrator would be applicable to.

First, there are EDI Extension projects. These projects are typically leveraging an existing EDI infrastructure into new realms. One company has a large insurance claims and renewal processing system that today is only semi-automated. It currently uses other Sterling Commerce products, CONNECT:Direct and GENTRAN, for EDI. EDI transactions are received (through various means, including file transfer, e-mail, fax, and tape), virus checked, manually run through GENTRAN, and the output files manually routed to back end

applications. Eight people are involved with managing this system today—making the customer displeased with the management of the process. The company has plans to expand the number of partners they do business with electronically. Therefore, today's semi-painful, semi-manual system is not an option for the future. The desired model for an automated version of the process, with exception handling built in to allow human intervention only when necessary, requires STERLING Integrator. STERLING Integrator has adapters for CONNECT and GENTRAN and can automate the virus checking, partner look ups, routing, and all existing EDI processing that the customer does today.

Second, there are projects involving application integration with human interaction. One company is pursuing a business initiative as a neutral 3rd party clearinghouse for the telecommunications industry and needs to implement an automated CARE (Customer Account Record Exchange) process. This company will use STERLING Integrator to enable support for human intervention for exception processing a key requirement for this system.

Third are strategic platforms buys. One company is planning on using STERLING Integrator as a platform for building a private exchange. Other customers are using it to integrate with RosettaNet, or to migrate portions of EDI processing off on a VAN and onto the Internet.

Fourth are ebXML projects. The specific component of ebXML being considered for pilots is the ebXML Messaging Service. This can be viewed as a new standards-based secure Internet pipe with request-response capability and which is payload agnostic. Sterling Commerce is driving the build-out of the ebXML framework through extensive participation in the ebXML OASIS technical committees and participated in the first round of ebXML interoperability testing sponsored by the Drummond Group in fall 2001.

Finally, there are integration consolidation projects. Several companies have long-term initiatives to consolidate disparate integration deployments. One company is consolidating from 40 major applications down to Oracle Financials and a handful of others. They are also undergoing massive data center

consolidation. On top of this, they are planning to substantially expand their Internet B2B usage. They will use STERLING Integrator as a strategic integration platform that functions as a linchpin to achieving this consolidation on a timely basis while rapidly enabling new partners.

Ultimus: A BPM Summary Report

Overview

The Ultimus Workflow Suite v5.0 is a Web-based enterprise workflow automation product that provides human-to-human and human-to-application business process automation. Using graphical development tools, it enables companies to design, develop, test, implement, monitor, and measure business processes using a Web browser as the client. The Ultimus Workflow Suite is designed for scalability, and focuses on exception management.

Process Modeling

The businesspeople that actually execute a process are typically the best people to design its business logic. The graphical process design of Ultimus allows users to model business processes without the need for programming or scripting. This allows businesspeople to design processes according to their needs, while IT staff can take care of application logic.

Ultimus works to make process management ubiquitous by enabling workflow players to participate in business processes using the browser. This serves the purpose of bringing workflow to where it is needed—every desktop and mobile device, such as a PDA.

Process Monitoring

Ultimus provides process monitoring so that users can obtain process metrics in order to evaluate performance. Every corporation seeks to optimize their processes and this capability gives them a means by which to do that. The Ultimus Workflow Server offers a Web-based reporting module that lets business managers generate process metrics from real-time information. Thus, businesses can respond to problems or make changes to processes in real-time.

Process Operation Capabilities

Ultimus allows a company to use Active Directory, NT Directory or any LDAP-compliant Directory as the repository of user names, passwords, and other information. Because of this, it is relatively simple to be able to manage user names and passwords—a company can just leverage the information it already has. Ultimus also enables companies to maintain an Active Directory-based organization chart so that the processes can independent of the individuals in the

organization. This chart is graphical so as to enable ease-of-use.

The Ultimus Workflow Suite offers a variety of features for security. The Ultimus Server can be configured to communicate with the browser client via SSL using 128-bit encryption.

The role management function of the Ultimus Administrator can ensure that only users who have access rights to application information can use these applications. Access rights for users and groups are established in the Ultimus Administrator and are based on the user's domain name and password.

Every Task in an Ultimus Workflow process has a specific Recipient or "owner." Only the owner is assigned the Task by the Workflow Server. This controlled participation means that there is no way for the wrong person to have access to a Task that they do not own, or that has not been assigned to them. Ultimus provides seamless database connectivity via Ultimus Forms. Any task recipient can be set using a variable rather than a hard-coded name, meaning that the process can choose the recipient based on information generated in earlier process steps.

As previously mentioned, any user wanting to access the Ultimus Client must also login using their NT or LDAP user-names or passwords, or are logged-in using Unified Login if they are working on Windows machines. Thus, even if a user accesses workflow from a PC that is not in the primary domain, the user is authenticated before they have access to the Client and the Task List. Because Ultimus recognizes users according to their network user name and password, users can login from anywhere that the network is accessible, needing only a standard Web browser to access their Client and Task List.

Automation

A danger associated with deploying technology to automate processes is that the process may not work when released to the organization, leaving a company without an automated process and a lot of wasted time to show for it. Ultimus can mitigate this risk by giving companies the ability to simulate process behavior, across the enterprise, before it is deployed. Users can test the process and make corrections before the final version is set in stone. The testing of processes is not done in isolation; the process is validated across the entire organization and in the context of other processes it will interface with.

One of the main focuses of the Ultimus Workflow Suite is exception management. Exceptions exist in virtually all organizations and can be a constant point of pain for those employees responsible for process execution. Ultimus manages exceptions and special conditions through event condition tables, distributed administration of users, exception handling, and the handling of exceptions to exceptions. These capabilities are offered out-of-the-box as a means to facilitate the automation of complex business processes.

In many organizations, events of one process need to kick off another process. Ultimus supports this capability through nested processing. What this allows an organization to do is automate large, complex processes by breaking them down into smaller, simpler, sub-processes. Each sub-process then invokes another sub-process in succession until the overall process is executed.

Integration

Integration is an important concept in the context of BPM. Ultimus provides support for XML, allowing workflow applications to integrate with other XML-enabled applications. It is not just about application to application (A2A) integration; Ultimus supports A2A, P2A (people to application), and P2P (Peer to Peer) integration, thereby covering the whole spectrum of integration as it relates to a business process.

A key feature of the Ultimus Workflow Suite is the existence of Flobots. These allow a process to interact with third-party applications such as databases, word processors, or applications such as ERP and use them for to execute the tasks of a process.

Flobots exist out-of-the-box for such products as: Microsoft Excel, Word, Exchange, and Sharepoint; Adobe PDF; enterprise databases; scripts; XML; and ASCII files. Other Flobots can be easily developed using a published API. Flobots can be used as the basis for EAI capabilities. The Ultimus FloStation hosts the Flobots. It maintains a task list for each Flobot and schedules their execution. Multiple FloStations may be configured for convenience and scalability.

Ultimus provides integration of the Ultimus Workflow Suite and Microsoft BizTalk Server 2000 to offer an integrated business process management. This combines the EAI capabilities of the BizTalk Server with the general-purpose workflow automation capabilities of the Ultimus Workflow Suite. It allows organizations to develop test, deploy, and upgrade

business process automation solutions that reach users as well as enterprise and desktop applications inside and outside the organization.

As an EAI solution, BizTalk can be used to move information from one application to another as a part of a business process. Therefore, integrating Ultimus with BizTalk gives user the ability to exchange information with enterprise applications that have a BizTalk connector.

Ultimus also aims to enable workflow processes across enterprises. The need to allow companies to deploy business processes that include participants inside and outside the organization including partners, customers, and vendors, is important now more than ever as globalization continues.

Technology Platforms

Ultimus utilizes a three-tier client-server architecture that leverages Microsoft COM+, .NET, and Windows 2000 Application Center Server.

Ultimus Leverages the Microsoft Windows 2000 Advanced Server platform with COM+/DNA and clustering for dynamic load balancing and redundancy. Thus, Ultimus should be as scalable as any enterprise application that relies on Microsoft Windows 2000 Advanced Servers and Windows Application Center 2000.

Ultimus U2Net is a technology that enables all modules to communicate with the server using COM+/DNA for client/server performance in the intranet, or HTTP/HTTPS for long-distance communication over the Internet. This allows Ultimus to deliver via the Internet at the speed of a client/server application.

The strategy for Ultimus is to maintain deployability the Microsoft environment, while having a thin client that works across multiple platforms by leveraging XML, ODBC, and other industry standards.

Standards Participation

Ultimus believes that new standards will emerge that will be based on Internet protocols, such as XML, and is preparing to support those standards as they evolve. Currently, the Ultimus COM/DCOM interface provides a mechanism for interoperability with other workflow systems.

Ultimus' strategy is to provide compatibility with de facto standards such as ODBC, XML/SOAP, HTTP, HTML/JavaScript, and browser-based client.

There are several standards that Ultimus views as crucial to the company's success: Web Services, XML, SOAP and UDDI. The company's goal is to provide interoperability on a wide scale.

Case Study

The government offices of Prince William County in Virginia had become awash in paper as the 1990s progressed. With over 3,000 employees and such paperwork as evaluations for each one of them, managing information about human resources grew into great challenge. Exacerbating the problem was a lack of productivity due to the complexity of managing processes that were paper-based. For example, in reviewing an employee, a manager might have to send a file around to several other employees for their comments and signatures. At any given time, the manager may not know who is in possession of the file or whether they have completed their task.

It was these factors that led Prince William County to engage in an initiative to improve productivity. First, the county wanted to reduce the amount of paper that passed across the desks of employees. Because Human Resources processes were very paper-intensive, these were the first to be addressed. Prince William County brought in Ultimus to automate and digitize the employee evaluation process.

Before Ultimus, the employee evaluation process involved a manager using Microsoft Word or Excel to create the evaluation, followed by printing and physically sending the documents to others for comments and signatures. With Ultimus, the need for these printed sheets is virtually eliminated. Built-in forms are now available through a browser for managers. The forms are circulated electronically for approval and digital signatures. Instead of sending a file to another manager, waiting to get it back, then sending to the next manager, the digital evaluation is automatically routed to the correct people within the process.

There are exceptions within every process and the employee evaluation process at Prince William County has its fair share. In some cases, it is simply necessary for paper to be involved. The Ultimus product is prepared for such a scenario. If paper become

necessary, the document can be scanned and attached to an event within the process (essentially become digitized within the process).

A key benefit for Prince William County was the ability to integrate the system directly to its Human Resources Information System (HRIS) and document management system (Documentum). Because of this integration, the county saved countless hours of data entry that had previously been required to get data from paper into the systems. The Ultimus product also came pre-integrated with their e-mail system, Outlook. Because of this, the county could easily employ e-mail notifications for process participants.

Prince William County's Employee Performance Evaluation/Merit Pay process has resulted in an average reduction in process time from three weeks to one to two days. The benefits derived from this automated workflow process accrue from doing something once, getting it correct the first time, and not having to do any repeat or follow up work—forms are filled in and calculated correctly, all data and supporting documents stay together, and forms are not lost or misplaced and are completed in a timely manner. The element of time is crucial—previously, those supervisors who submitted evaluations early (in an attempt to get an employee a raise by their anniversary date) caused confusion due to conducting evaluations well before the employee's anniversary. Other supervisors completed forms at the anniversary date, causing raises to go into effect late and triggering retroactive raise processes. With the automated system supervisors can do the performance appraisals closer to the employee's anniversary date and the pay raise data is automatically entered in to the payroll system with the appropriate effective date.

About This Document:

The product-specific information contained in this document is intended to provide an overview of a specific product and vendor at the date of publishing. Facts presented have been verified to the best of our ability with the vendor and actual users of the product where indicated, however, Delphi cannot insure the accuracy of this information since products, vendors, and market conditions change rapidly. Delphi Group makes no implied or explicit warranties, endorsements, or recommendations in this report nor should such warranties be inferred from its contents. A complete assessment of your specific application, the method of implementation for a given product or technology, and the current state of that product must be considered in order for a recommendation to be made on any product's suitability for your purpose, needs and requirements.

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