MERIDIAN SYSTEMS

PROLIANCE

Understanding Business Process Management and Workflow Capabilities of Proliance

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Meridian Systems
1180 Iron Point Road
Suite 300
Folsom, CA 95630
USA
916/294-2000
www.meridiansystems.com

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Executive Overview

Business Process Management (BPM) is the science of understanding your whole business and its smaller, discernable parts. Each part can be broken-down into various proven steps and processes. As the first BPM tool for corporate real estate and construction applications, Proliance® uniquely automates and controls these processes, which begin at the planning stage for a new or remodeled facility, and endures all the way through facility construction and maintenance.

Today's fast-paced business enterprises require a mission critical solution to help maximize cash investments across projects, shorten project delivery times, and increase revenues from new facilities. Organizations must make these improvements with fewer staff and across a myriad of partners collaborating together. Reviewed below are the three core foundational elements that allows Proliance to effectively meet these requirements:

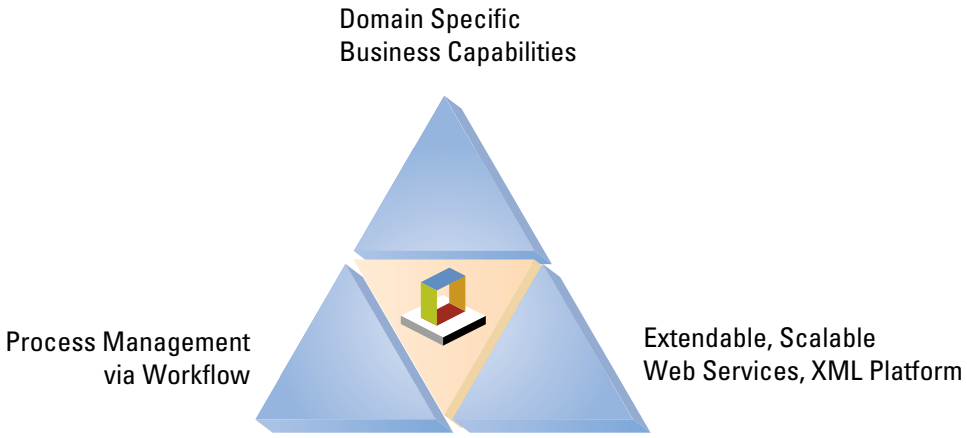
Domain specific business capabilities: A truly effective system must manage many design and construction specific documents, such as the scope document within the budget development process. Proliance manages these documents and helps to accurately forecast project costs in the future, rather than just look at historical costs after the fact. Managing the inter-relationship of design documents, budgets, change documents, and safety plans is paramount to understanding every possible impact to a project.

Process management through workflow: Each specific design or construction document must be routed through various people and organizations in a timely fashion. Proliance configures these documents and processes them according to your company's best practices and keeps an audit trail of every document action. Proliance can also send the right information to the right people at the right time, all via the Internet. Each document has a life cycle of processes that Proliance can efficiently manage.

Web Services and XML extendable and scalable platform: Proliance is a mission critical application that can withstand the rigors of today's IT environment. Through Web Services and XML, Proliance can integrate with any other enterprise application for real-time data sharing. Proliance is scalable to grow with your company as it adds new processes, people, or server. Proliance also has multiple methodologies for streamlining collaboration among your trading partners.

As a BPM solution, Proliance brings forward two supporting principles: Business Process Automation (BPA) and Business Process Integration (BPI). BPA through Proliance automates the end-to-end process that leads to increased operational efficiency, lower costs and improved revenue. BPI through Proliance links an organization's internal systems in order to connect with trading partners more efficiently and at a lower cost.

The purpose of this white paper is to focus on the process management and automation aspects of the Proliance solution. Proliance was designed to be highly configurable so that your company can customize how it uses the system. This paper reviews in detail the key business and technical aspects that work in unison and allow Proliance to fit your company's needs.



Proliance BPM and Workflow Capabilities

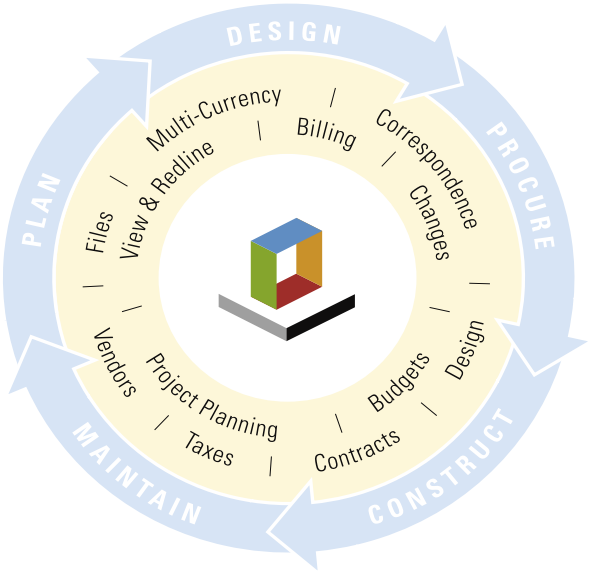
Defining BPM in Facility Life cycle

There are essentially five major stages that every real estate facility or building projects goes through: Planning, Design, Procurement, Construction and Maintenance. Each major stage can be broken-down into numerous processes. For example, site selection, budget development, pre-construction, design management, and change management are all processes that extend across all five stages.

These processes usually include various internal departments and external partner companies, such as owners, planners, architects, engineers, general contractors, subcontractors, suppliers and building product manufacturers. The number of best practices and processes involved can be very different depending on what type of facility (restaurant, hospital, biotech lab, airport) is being constructed.

Most processes are driven from a "project paradigm", like contract, change, and billing management documents that are processed at the project level. There is also a "program paradigm", where processes are managed as a collection of smaller projects, grouped together with some major similarities. Lastly, there is the organizational paradigm, where processes like vendor and client management, corporate safety, and quality plans are managed from the corporate level. Not only do processes fall within each of these paradigms, but span across them as well, such as when projects commonly push back to corporate monthly revenue and profit projections. For example, a common corporate process is to send approved insurance certificates down to the program or project level.

Because of this complexity, Proliance manages processes from each organizational perspective and coordinates the interaction between these different views.



"If you don't have any internal process controls on your IT systems, you're going to have a lot of changes to make. Sarbanes-Oxley is all about internal process controls."

Rich Mogull, Director of Information Security and Risk Practice, Gartner

Value of BPM

An organization can gain varying values by implementing a BPM system. Both public and private business organizations are facing stricter corporate governance due to Sarbanes-Oxley legislation. This legislation states that by the end of 2004, CEOs and CFOs must take corporate responsibility for financial and internal control reports, assessing the effectiveness of their internal processes. "If you don't have any internal process controls on your IT systems, you're going to have a lot of changes to make. Sarbanes-Oxley is all about internal process controls," stated Rich Mogull, Director of Information Security and Risk Practice with Gartner Inc. (CIO Insight Magazine, August 2003).

Therefore, the value of a BPM system, like Proliance, derives from helping companies to comply with stricter corporate governance requirements and ensuring the accuracy of financial numbers that incorporate capital construction costs. An August 2003 reference from CIO Insight Magazine also indicates that software can "automate processes that may make Sarbanes-Oxley reporting more efficient by focusing on business processes and streamlining steps that were formerly spread out through various applications."

Beyond these corporate governance requirements, BPM solutions create tremendous value as a tool for defining your organizational best practices. By verifying that these are being followed consistently across the company, you can ensure that your processes are working.

Status of the Market

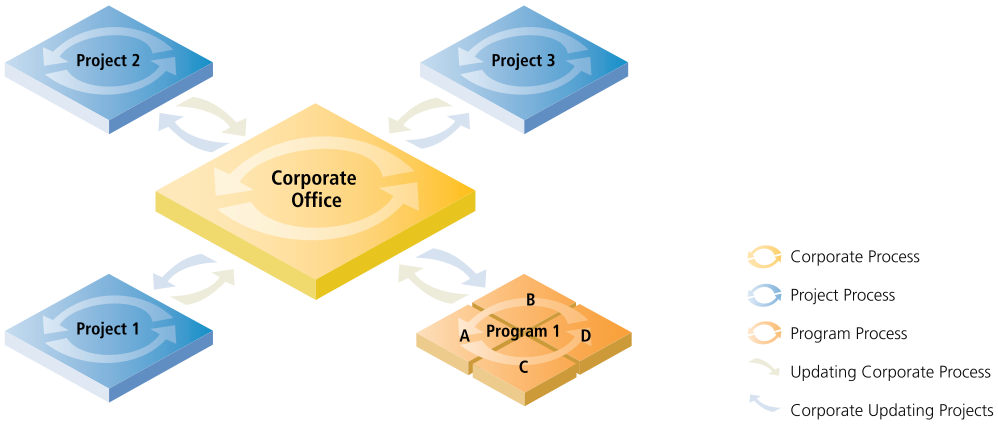
Many real estate owners, including publicly held organizations and government agencies, have some of their best practices defined. They have many different departments involved in the construction life cycle, including real estate, engineering, design, construction, finance and facilities management. Traditionally, these departments have not worked on a common software system, preventing an automated best practices solution. What good are departmental best practices and defined processes if there is no company-wide system in place to automate them, enforce their compliance, and evaluate whether they are working?

Engineering and Construction firms are service-oriented and build for various owner market segments. These service firms must accommodate the processes of each individual owner and the various markets segments within which they operate. An engineering or construction firm must also apply different sets of best practices for each type of facility they design and build. While many service companies have processes defined, they do not have a software solution to quickly modify them for market or geographical change, automate them for efficiency, or enforce that they are being used company-wide.

From a compliance perspective, Debra K. Rubin and Mary Buckner Powers report in Engineering News Records' July 21, 2003 issue that "more engineering and construction firm managers will confront significantly more complex and time-consuming federal rules, lender scrutiny and industry peer pressure to implement governance changes." The impetus to implement better process controls, according to these authors, is the fear of liability from corporate surprises that directors fail to discover or prevent. Their article includes supporting comments from Ralph Peterson, chief executive officer of CH2M Hill, who states that "our vulnerability is in project surprises. The industry is famous for that."

Incorporating BPM through Workflow

Proliance is designed with two distinct technical levels that include platform services and business applications. Proliance delivers BPM through a workflow engine that is a major technical component of the platform services level. Proliance's business applications work seamlessly with the workflow engine, by running on top of platform services. For instance, workflow automates change orders that, as part of a business application, must be approved and received by several people. For each state change, workflow tracks modifications and automatically distributes the change order to the correct person.



Proliance provides true BPM because its technical architecture supports documents and information at the corporate, project and program level. As an example, the corporate level deals with corporate management plans like safety guidelines, monthly profit projections and approved vendor lists, while programs and projects deal with scope documents, contracts, and invoices.

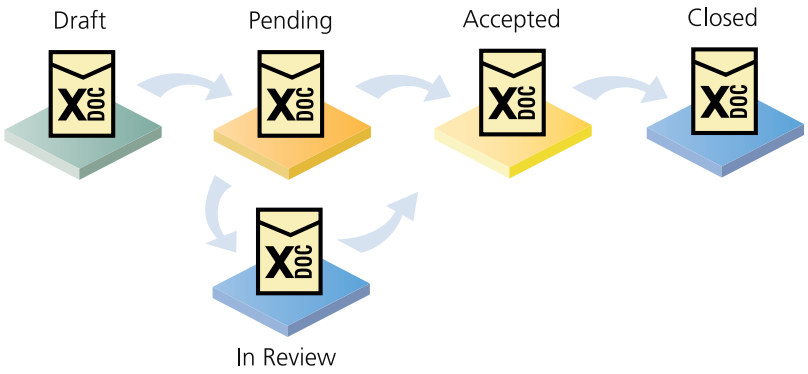
Because Proliance's workflow engine resides at the platform services level, it can drive every single piece of information or document through your process. This is due to Proliance's third-generation Internet architecture built on the technical concepts of Web Services and XML. Previous Internet applications developed without these technologies, have clumsy, hard coded, non-uniform, non-standard, and non-configurable process concepts. Proliance elevates true BPM with an innovative design built from the ground up using Web Services and XML. Proliance delivers configurability and adoption-level choices, strong differentiators from previous total re-engineering efforts required by ERP systems.

Building Blocks of Proliance's Workflow

Proliance is built on a native XML document technology platform called Xdocs. Consequently, an XML schema defines the structure of every Proliance document (such as a contract, invoice, change order or RFI). The XML document is the object that the workflow engine processes through configured rules and actions.

Every XML document in Proliance has a series of intelligent states. These states are key milestones along the path of a document's life cycle. For example, an XML document like an invoice has a number of states – Draft, Submitted, In Review, Pending Approval, Approved and Cancelled. Through your implementation process, you can configure your own rules for the invoice at every state of the document. You can also decide which fields are required at every state of the invoice document.

Each Xdoc gets routed through intelligent states that you can configure to match your company requirements and best practices.



Proliance's workflow engine can distribute XML documents as unique URLs through e-mail to your design and construction partners, allowing them and your own internal employees to participate in your workflow processes.

One of the most powerful aspects of Proliance's design is that every XML document has a unique URL. This concept is a result of a native Web Services and XML architecture. The significance of this architecture is tremendous, as Proliance's workflow engine can distribute these XML documents as unique URLs through e-mail to your design and construction partners, allowing them and your own internal employees to participate in your workflow processes.

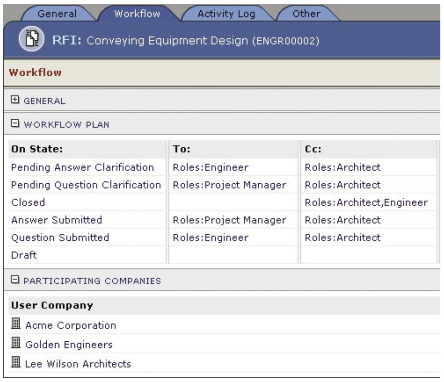
Proliance's Three Different Types of Workflow

Proliance's workflow engine provides your organization with extreme power and flexibility by matching your best practices and company methods of distributing documents to people within and external to your company. Other workflow technologies usually require your company to absolutely define every step and process in order to adopt the technology. Often times this becomes a significant barrier to adoption, because many companies do not have all their processes defined for every single kind of document. These other kinds of workflow engines dictate, "either you define every process, or it won't work."

Proliance's workflow engine behaves in three different ways. From one end of the extreme, if your company is ready, you can configure absolutely every document to follow a configured routing and approval. From the other end of the extreme, Proliance can behave like an e-mail system, where you view a document and then determine to whom you want to forward and distribute the document to without any state changes. The following is a brief description of the three different behaviors of the workflow engine.

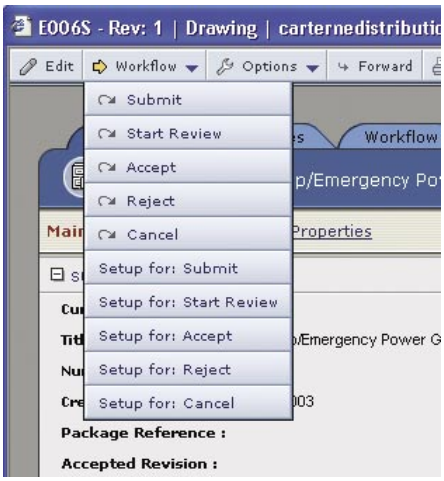
Configured Workflow: Proliance matches your company's best practice for documents in the design and construction process. This allows you to enforce a certain pre-defined approval route for each document. The configured workflow automatically forwards the document to the next person who has the assigned role to take action on the document, creating a secure environment where only the person with the right role can take action on the document. Each participant has pre-defined or pre-configured actions along the life cycle of a document. The system is also flexible for certain people with the right role to move a document forward, even if the document was not sent to them. This configurability of the system prevents documents from getting stalled with one person who happens to be on vacation or who is otherwise unable to review the document.

This is an RFI document with a configured workflow. Notice how the states of the document are linked to certain roles in the process.



Ad Hoc Workflow: When you create XML documents, you can use your human intellect to decide who in your contact list should receive a document to process and act upon. The document is still routed through intelligent states, but you have the ability to choose who needs to review and approve documents. The recipient is expected to take action and move the document to the next state.

Each document has an easy-to-read workflow button that presents a list of possible workflow actions.



Ad Hoc Distribution: Just like in e-mail, you can open any XML document and forward it to someone else. Often times project management solutions do not capture normal e-mail correspondence, but Proliance captures your notes and messages to others as you forward any document in the system. During any one of the three behaviors, the workflow engine can also automatically distribute copies of documents as they change from state to state.

Once you select a workflow action on a document, a simple dialog box is shown to distribute the document.

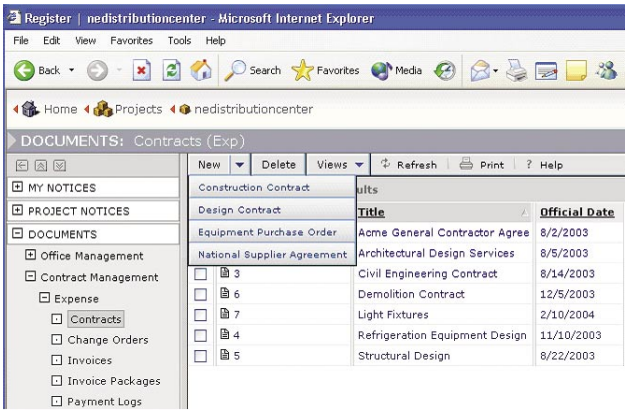
Proliance's Template Driven Workflow

Document Template Workflow

As an enterprise system, Proliance is powerful because of its configurability. Proliance is a native XML system where every document has an XML schema. The power of Proliance allows you to create different document templates for different types of documents, such as contracts and scope documents. For instance, you can create a series of different contract templates for your design contracts, construction contracts and equipment vendor contracts. When using configured workflow, you can create different routing processes

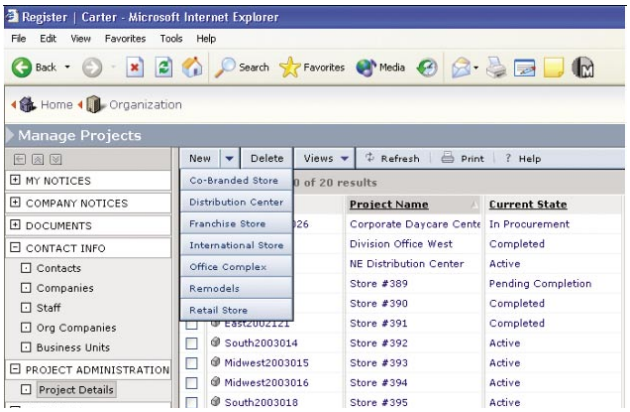
for each one of your contract templates. Your design manager receives all design contracts routed for approval, the construction manager gets the construction contracts, and the equipment manager receives the equipment contracts.

Each contract document template can be configured differently, as your best practices demand it.



Project and Program Template Workflow
Proliance's multiple document template design is encapsulated in project or program templates. Proliance allows you to create multiple project templates to match your organization's types of projects. As an owner, you can create templates for retail, distribution center or office projects. As an engineering or contracting firm, you might choose project templates based on markets, such as pharmaceuticals, education, manufacturing, energy or others. This system allows you to configure different workflows

Design your project templates with different configured workflows



for different kinds of projects, so division or business unit managers are automatically routed on documents for their review or approval.

With template-driven workflow, your organization is not limited by a system that only handles a process one way, and does not give you the flexibility to accommodate processes for different projects. Proliance provides the organization with a flexible and adaptable workflow engine that changes when the business or projects require it, as well as models your best practices and processes at organization, program and project levels.

Proliance's Added Value Workflow Steps

There are certain key documents that sometimes require multiple steps within a given state of a document. Proliance gives you the ability to determine sequential or concurrent steps for document review or approval by multiple users. This added power to the workflow concept can certainly match your complex review, routing, and approval processes.

Workflow on Structured Documents & Unstructured Files

Proliance is an application built to manage information using the structured XML format. However, during the design and construction life cycle, there is still a tremendous amount of data stored in unstructured files, such as pdfs, bitmaps, jpegs, cad files, or MS Office documents. Proliance allows you to create Catalog Cards for every file uploaded to the file management system. The Catalog Cards are XML documents that are representations

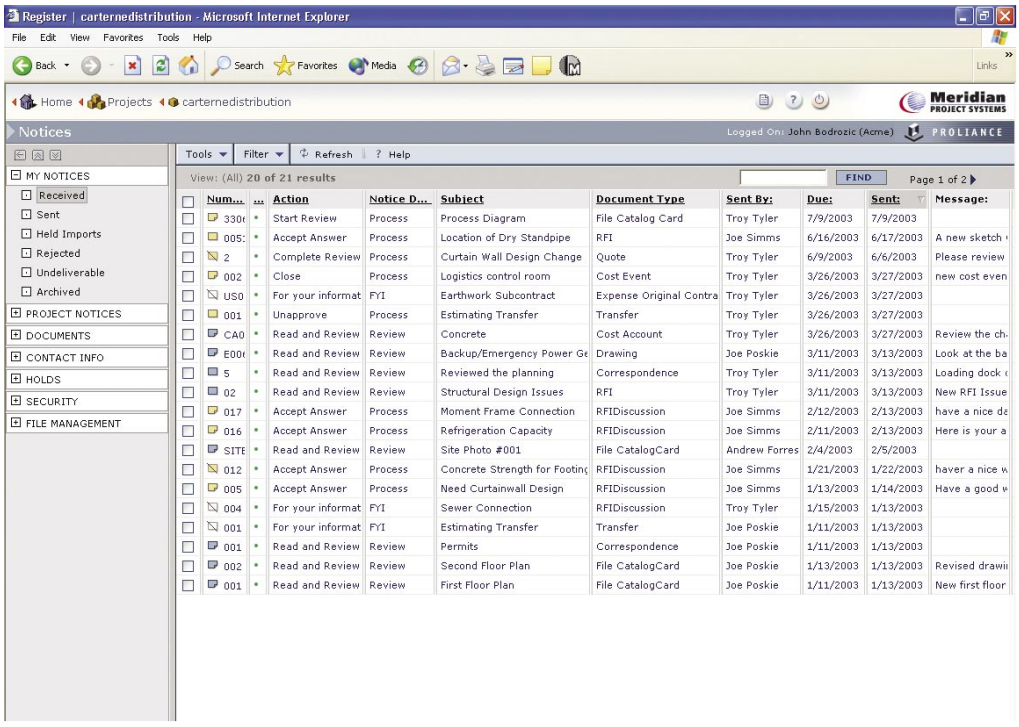
of the files to which they are linked. This concept now allows you to route these catalog cards and their associated, linked files through the workflow engine. You can route for approval any file in the system using the same workflow engine that routes the structured XML documents through a process.

Employee and Partner Interaction with Workflow

Understanding every best practice within your organization can be a daunting task. Most employees do not know or need to know every best practice or the workflow for every document. But every employee wants an easy-to-use interface to execute documents through the workflow process.

Proliance is also built on a loosely based messaging architecture concept. For your end users, this means that the workflow engine presents documents to them in a messaging concept. When a document is sent to you by the workflow engine, the document comes with a Notice that tells you whom the document is from, when that person sent it to you, the expected action you should to take, a custom message, and an expected due date and priority. The following list describes this easy to use methodology and how the user "sees" the workflow.

My Notices is your central messaging center where all your notices are received. You can easily select any notice and instantly see the corresponding document.



Notices Center: The Proliance user interface provides you with a personal Notices Center where you can instantly see every notice and associated document that has been sent. The Notices Center also has a folder for all the notices sent and archived. This center behaves very similarly to an e-mail system with a central location for all incoming and outgoing information. This becomes a personal single-system workspace that prioritizes work and keeps you informed of everything you need to know.

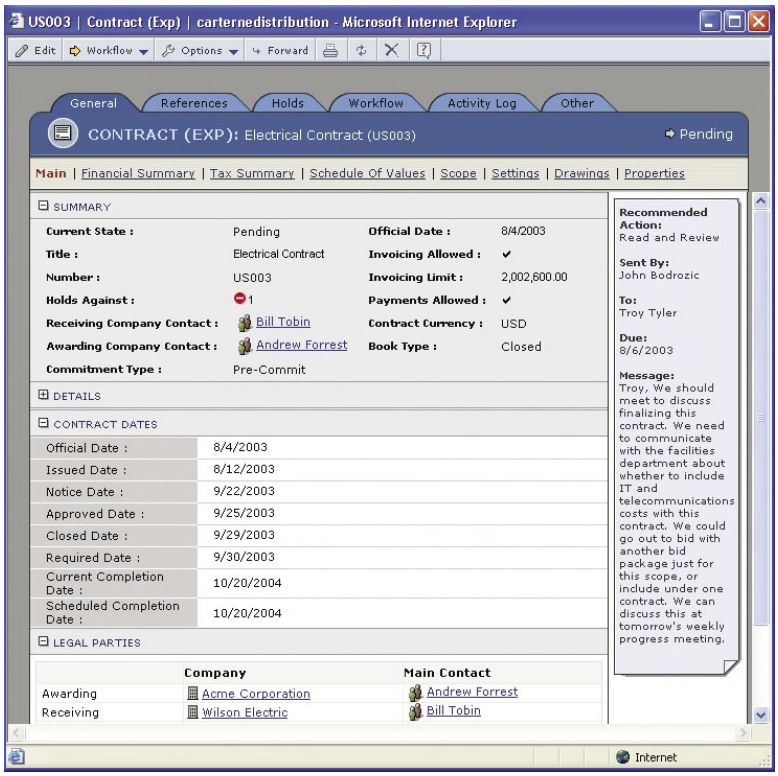
Notices on Documents: When opening a notice from the received folder, a document is presented to the user. The appropriate notice type is shown to the user as an "electronic Post-It® note" on the right side of the document. This makes it extremely easy for the user to understand why someone sent the notice and for the user to view the details of the document at the same time.

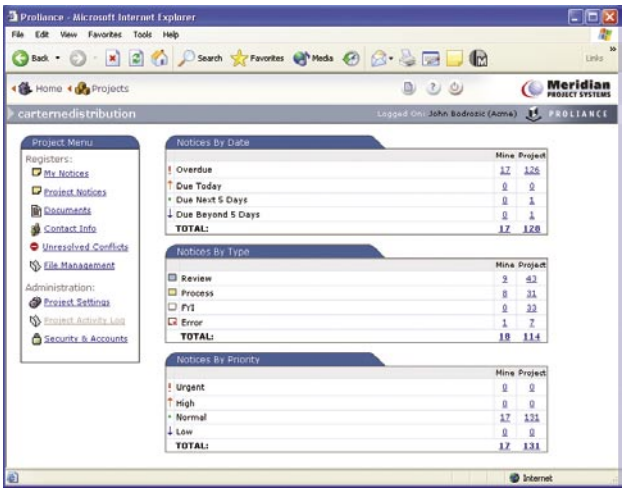
Notice Actions: When the workflow engine processes or distributes a document, a notice is generated. There are three different types of notices that are presented to a user in the Notices Center.

Process Notices: These notices are color-coded in yellow and sent with the expectation that you will change the state of the document, and then route the document to the next state.

Review Notices: These notices are color-coded in blue and sent with the expectation that you will review, and edit the document if needed, but not necessarily change the state of the document.

FYI Notices: These notices are color-coded in white and sent to you by the workflow engine when you are copied or "cc'd" in the process.





Notices Dashboard: Proliance provides each user with a dashboard that summarizes all the notices that have been sent to them. The dashboard easily groups these notices by date, by actions expected, and by urgency. This dashboard instantly gives the user a priority of documents to review and process.

The simple yet powerful ways that Proliance presents the "workflow" to the user are extremely important. No matter how powerful your workflow engine is, you will never see the return on investment if your entire organization does not understand how they interact with these workflow processes. Proliance's workflow concepts are extremely powerful and configurable, yet the complexity is hidden from day-to-day users.

The people that interact with workflows and processes in Proliance can be both internal employees that span multiple departments and locations, as well as outside vendors, consultants, and contractors. Proliance's web-native workflow allows internal and external parties to access their Notices through the Internet, from anywhere in the world.

Workflow and Security

Any system that has a workflow engine must integrate with an application security model for a symbiotic relationship. Proliance has a powerful security model that is role-based. You can define as many roles as you need, and assign these roles access to various business documents and processes. Security and workflow intersect when you configure the state of various documents so that only certain roles can take action on documents during these states. An example of this is creating a role called "Construction Contract Manager" and linking to this role a template called "Construction Contracts" at the "Approved" state of this document. This example ensures that the only people who can approve "Construction Contracts" are individuals who have the role of "Construction Contract Manager."

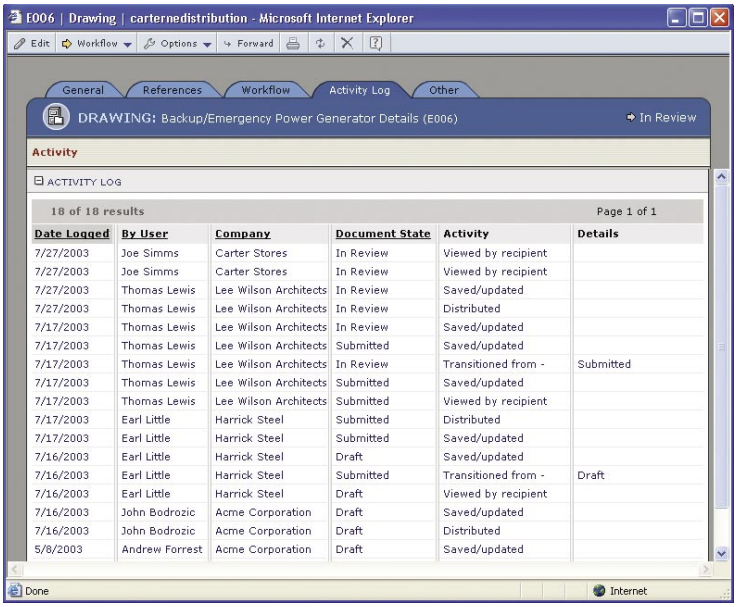
Proliance's combination of multiple security roles, multiple document templates and numerous states for every document provide an extremely configurable system that matches your best practices, automates processes, and enforces that best practices are being followed.

"End users can gain considerable return on investment by optimizing efficiency, accuracy, and exception handling of even a single business process," said Hollis Bischoff, vice president, META Group. "In particular, enterprises with people-intensive processes have unique challenges in BPM implementation. These users should pay careful consideration to offerings that demonstrate strength in automating the people element of the process equation." *(The New Paradigm for Business Process Management; Lynn Guinta; Constructech Magazine; August 2003)*

Importance of the Audit Trail

Every document in Proliance has a life cycle as it progresses through various states of the workflow process. Some documents may have a short life cycle, while other documents may have many iterations and much longer life cycles.

As a result, Proliance provides a powerful audit trail of each and every document in the application. The audit trail logs every date and time when someone views, edits, distributes, or changes the state of a document. This historical record keeps track of every internal employee and external partner who interacts with a document.



Date Logged	By User	Company	Document State	Activity	Details
7/27/2003	Joe Simms	Carter Stores	In Review	Viewed by recipient	
7/27/2003	Joe Simms	Carter Stores	In Review	Viewed by recipient	
7/27/2003	Thomas Lewis	Lee Wilson Architects	In Review	Saved/updated	
7/27/2003	Thomas Lewis	Lee Wilson Architects	In Review	Distributed	
7/17/2003	Thomas Lewis	Lee Wilson Architects	In Review	Saved/updated	
7/17/2003	Thomas Lewis	Lee Wilson Architects	Submitted	Saved/updated	
7/17/2003	Thomas Lewis	Lee Wilson Architects	In Review	Transitioned from -	Submitted
7/17/2003	Thomas Lewis	Lee Wilson Architects	Submitted	Saved/updated	
7/17/2003	Thomas Lewis	Lee Wilson Architects	Submitted	Viewed by recipient	
7/17/2003	Earl Little	Harrick Steel	Submitted	Distributed	
7/17/2003	Earl Little	Harrick Steel	Submitted	Saved/updated	
7/16/2003	Earl Little	Harrick Steel	Draft	Saved/updated	
7/16/2003	Earl Little	Harrick Steel	Submitted	Transitioned from -	Draft
7/16/2003	Earl Little	Harrick Steel	Draft	Viewed by recipient	
7/16/2003	John Bodrozic	Acme Corporation	Draft	Saved/updated	
7/16/2003	John Bodrozic	Acme Corporation	Draft	Distributed	
5/8/2003	Andrew Forrest	Acme Corporation	Draft	Saved/updated	

Every document in Proliance has a chronological audit trail that logs each company, user and action that was executed

The business value of every document having an audit log is important because is helps to protect your position in any potential claim situation. You can re-construct the chronological, historical life cycle of every document in the system and understand by whom and when critical documents were processed during the entire course of the planning, design and construction process.

Integration with the Workflow Engine

Proliance's workflow engine is a powerful way of integrating with other mission critical applications in real-time. As part of configuring documents, you can set up the system to send an XML document to another system automatically as the document transitions from one state to the next. An example of this process could be a document like an invoice, moving from the "pending" to the "in review" state. As the document transitions, a copy of the XML invoice document is automatically sent to a financial application. In addition, real-time integration can be sent to Proliance's workflows, where the invoice could have been "approved" in a financial application, and then sent to specific users so the "approved" XML invoice would appear in the users Received Notices section within Proliance, and the user would know that it came from another system. This form of real-time integration is made possible by Proliance's workflow engine and its core Web Services and XML technology.

Proliance's open architecture of Web Services and XML works in conjunction with Enterprise Application Integration (EAI) applications. Your company may have different technical approaches to integrating applications, yet Proliance's technology platform works well with virtually any approach. This open architecture also works in parallel with existing infrastructure and IT investments; that openness gives you flexibility, knowing that Proliance will work with existing and future applications.

Summary

Business Process Management helps you to understand your whole business, as well as its detailed processes. Proliance elevates BPM to a new level by automating processes and extending workflow across the enterprise, from a projects, program, and corporate perspective.

Proliance provides value as a BPM system by helping companies to comply with stricter corporate governance requirements, as well as define best practices and verify that they are being followed consistently across the company.

Managing business processes with Proliance creates an environment of repeatable success. Once your company has defined a repeatable process, additional values appear including faster cycle times to process documents. In addition, the collection of these repeatable processes creates a risk management system, ensuring the right senior executives are immediately aware of potential risks. BPM systems that establish repeatable processes also enhance the quality of your services, and ultimately create a greater predictability of profits.

Unlike other workflow systems, Proliance was designed to be highly configurable so that your company can customize how it uses the system. It is also flexible enough to adapt as your business changes and grows.

Proliance was designed from the ground up with integration in mind. The technical architecture of Proliance is such that many components within Proliance "speak" to one another through XML and Web Services. This concept is an "eat your own dog food" metaphor because if other applications are going to integrate with Proliance, Proliance must integrate with itself just like it does with an outside application. It is important to question other vendors on how well their applications "speak amongst themselves" using Web Services and XML.