Orinda, California – November 1999

Web-Based Workflow and Document Management

Technical Overview and Case Study

Technical Overview

Product Description

Workflow is best described as the flow and control of information within a business environment. This flow and control of information is what defines your processes, many of which are critical to your business' survival. Managing this workflow in the most efficient manner provides your business with a competitive edge, allowing you to improve time to market, time to produce, and the quality of the products and services you provide.

Workflow applications are designed to achieve the maximum efficiency in management of business processes. These applications automate the planning, tracking and performance of tasks for a project or process, providing automated notifications upon predefined and significant events. The availability of the Internet and corporate intranet have for the first time brought the ability to easily reach every desktop within an organization, simplifying the implementation of workflow across geographic boundaries and throughout an entire business.

Axean Pacific's Web-Based Workflow and Document Management, is designed to web-enable everyday business processes and provide workflow and document control capabilities to any desktop or mobile user, regardless of location and time.

Architecture

Axean Pacific has developed a proprietary web-enabled database application which employs an Active Server Page (ASP) architecture built on Internet Information Server (IIS) 4.0/5.0 and SQL Server 6.5/7.0, and uses VBScript to provide key system functionality. JavaScript and PERL are also used to provide added features. NT is used to provide page level security, whereas additional security flexibility is provided through table-driven entries. Users can access the system via standard browsers (Netscape 4.x or Internet Explorer 4.x and above) to perform all functions, including ad hoc reporting and system administration.

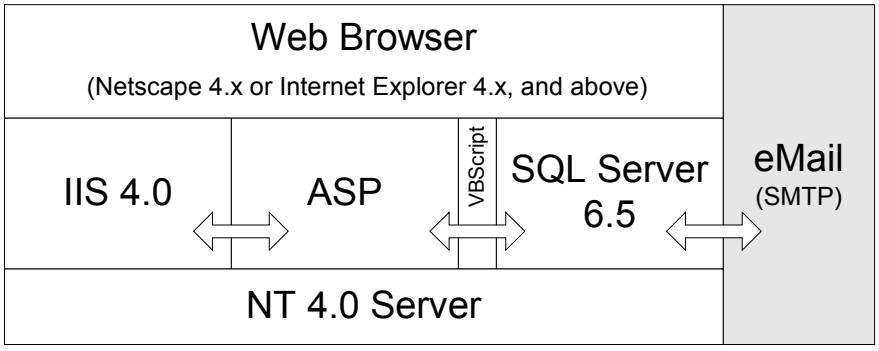


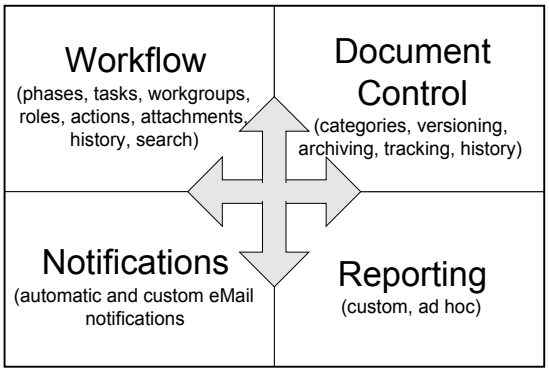
Figure 1. Minimum Product Versions

Processes are developed outside of the system and then are implemented within the application. Simple requests use the General Request or Document Request Forms already offered by the system, whereas complex forms and processes can be automated with additional development work leveraging standard tools and methodologies.

Current Feature Set

Significant system attributes include:

- Utilizes standard web client software, and is compatible with Netscape 4.x and IE 4.x browsers (and above)
- Provides the ability to set up and implement new processes in less than one day
- Provides flexible control of end user's actions by allowing administrators to grant permissions to individuals by roles or workgroup membership
- Filters views of workflow by various criteria (process type, owner, requestor, phase/status, etc.)
- Presents views of assignments and tasks by workgroup/individual to facilitate resource loading
- Allows escalation and overriding of the normal process through administrative privileges
- Provides automatic e-mail notification to new owner as assignments are made and new requests are submitted
- Permits customizable notifications for each phase/ownership change within a process and proactive notifications to detect potential problems (such as approaching deadlines)
- Allows phases to be subdivided into smaller tasks, using a predefined Phase Task template or by allowing for the creation of an Ad Hoc Task at any point in the process
- Allows linking of one or more supporting attachments (of any document type) to any workflow



- Allows configuration of attachment permissions – who can add, delete, etc. at each phase of a process
- Contains an ad hoc report writer that allows end users to run predefined reports or to create and save new report templates, with the added option of saving report results to Excel
- Provides multiple levels of security - NT security, database security, Verisign certification and customizable security at the workgroup and role level for each different process
- Includes a simple document management system with automatic promotion of documents from In-Progress to Production to Archive branches of document library
- Allows searching of various branches of Document Library and Attachment Library by document name, text string, and other criteria

Implementation Case Study

Background

In a recent project initiative, one of the nation's largest healthcare providers embarked on a complete overhaul of its regional and national information systems and technology infrastructure. As a core component of each engineering project, the company engineered streamlined processes using Axean Pacific's proven methodology.

As the company's projects moved forward with larger, more geographically diverse teams, automated IT processes and Document Management features surfaced as high impact requirements for communication, ongoing process improvement, and reporting and tracking of requests. High-level goals included:

- Organizing, managing and ensuring the currency and relevancy of the company's documentation
- Ensuring engineering processes, including integration, testing, versioning, and change/release management were followed
- Ensuring that published information was easy to locate via a web browser.

Realizing that to meet its goals of supporting decentralized teams while simultaneously implementing structured desktop and delivery services and providing a vehicle for national and regional system initiatives, the company would have to implement a workflow and Document Management system. The base system requirements were to provide Workflow and Document Management capabilities, browser-based client access, ease of maintenance, process implementation and change, and to be more cost-effective than higher end workflow and document management systems.

A Multitude of Challenges

Given the weight of pressing internal projects (including a national clinical system initiative and ongoing regional Y2K Remediation efforts) process automation to save time, prevent human error and enhance quality communications became a necessity. Geographically dispersed and decentrally managed team environments for engineering, operations, customer relationship management and project management made a centrally managed workflow system an imperative.

The company's engineering processes for desktop and server integration were among the first to be targeted. The integration chain of events had been mapped early in the process for both engineering and documentation.

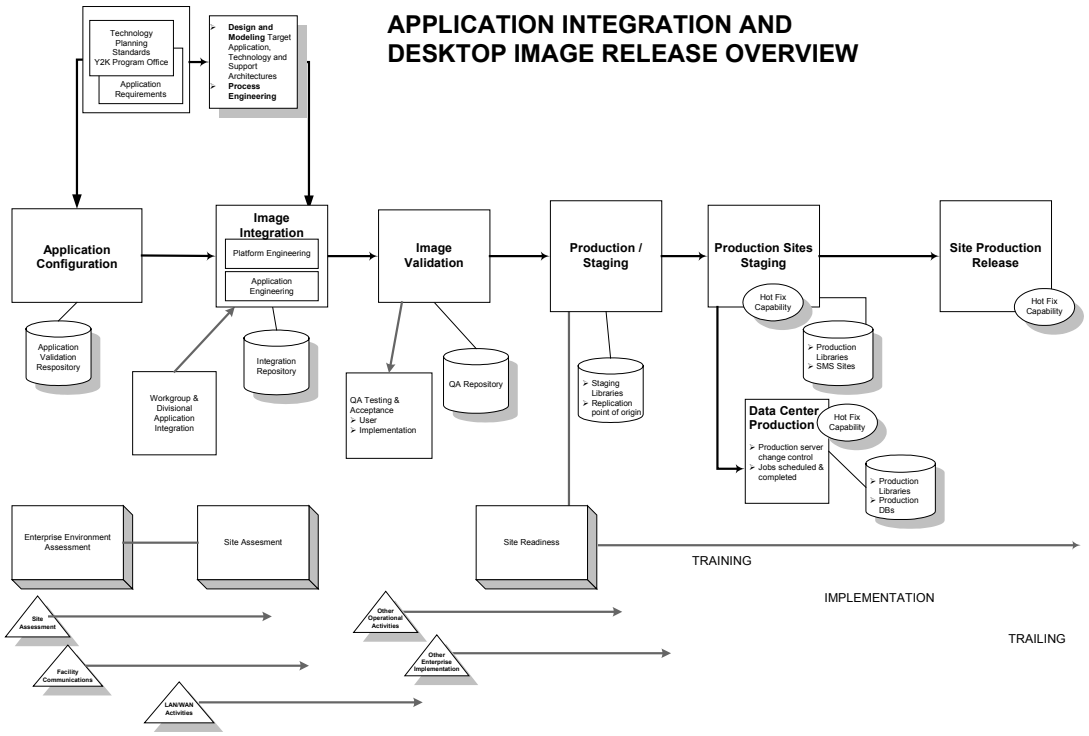


Figure 2. Application and Technology Engineering Workflow

Multiple internal reorganizations and resource optimization had caused some skill dilution within the teams responsible for parts of the process. Many key IT resources were reallocated for Year 2000 Remediation Projects from the core engineering teams.

The company's workflow requirements mandated an ability to implement multiple **processes** on a core workflow engine. Additional key requirements included ease of defining business processes and exceptions in either parent or child serial workflows, defining ad hoc workflows and the ability to override (with the appropriate security) any workflow.

Project **documentation** was also key to the success of the company's IT projects, including access to current documentation. Processes for ensuring documentation reviews, linkages, timely updates, and rapid deployment during Y2K Remediation and project implementation were bogged down through manual procedures. Web-based Document Management features, allowing for document searches, check in/out, subscriptions, version control and support for multiple document formats, with a security model integrated with the company's NT core services, were mandatory requirements. The documentation workflow was mapped according to the following chart:

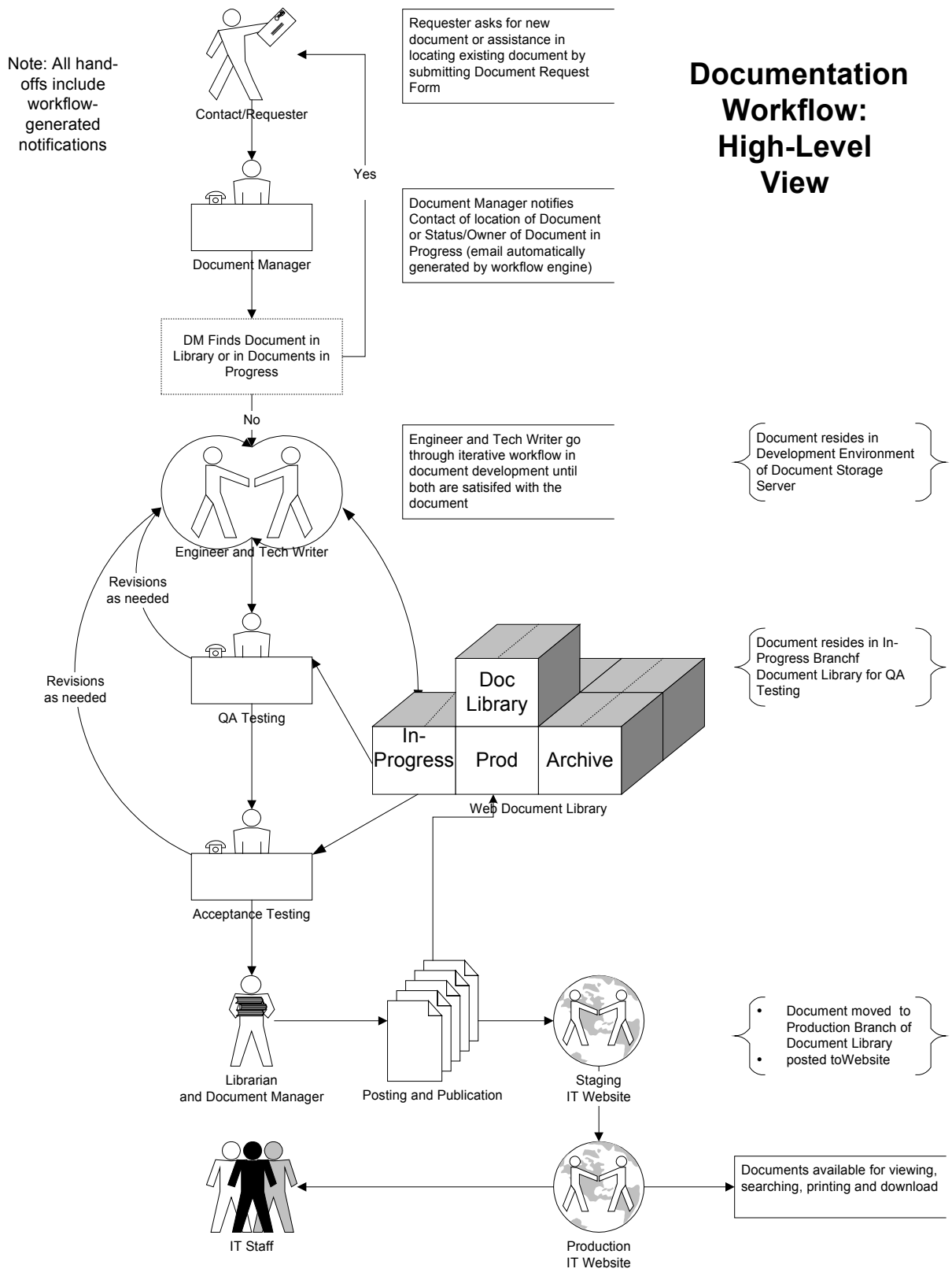


Figure 3. Documentation Approval Workflow

Accountability was an additional challenge for the company, as request tracking and management reporting in a geographically divergent environment were part of regular IT management routines. Ad hoc reporting via a web browser empowered team members to view information in the manner that best met their business objectives.

Technology transfer to key internal resources made it possible for the company to receive assistance in implementing the system, and then reduce the cost of the resources who would manage ongoing change and operations. Internal usage training on the new system was provided to key groups involved in implementing and changing processes in order to enhance implementation effectiveness. Minimal training was provided to the end users of the system on responding to workflow queue requests, finding documents and requesting updates, and creating reports, although the web-based system provided required very little explanation.

The selection of a **web-based system** that was not browser-dependent offered nationwide access to Workflow and Document Management features regardless of the client access mechanism.

The Solution

Axean Pacific's Web-Based Workflow and Document Management System was selected as meeting the company's automation requirements. During the analysis, it scored highest in the company's selection process, which included:

- Multiple levels of security integrated with NT4.0 and Windows 2000
- Browser and web platform independence
- Costs within project budgets
- Technology transfer promoting staff independence from contractors
- Ad hoc report writer as part of application
- Workflow and Document Management features at the level of top tier vendors

Axean Pacific provides Workflow and Document Management capabilities to web-based applications using Active Server Pages in a Microsoft Internet Information Server (IIS) environment, supported by an SQL Server database. Processes are developed outside the system, and then implemented within the application. Customized eMail notifications provide alerts and referrals to web links when appropriate.

The Approach

The methods used to analyze, select and implement the system followed typical structured methodologies. The current environment, including existing procedures were reviewed and re-engineered, including:

- Process maps, written procedures and standardized templates for all workflows associated with engineering, implementation and support documentation.
- A documented storage architecture for in-progress, final and archived documentation.
- An updated look and feel for documentation web sites, with enhanced searching and automation of web page creation for document posting.
- Methods for notifying the Documentation Manager of issues regarding any of the posted documentation.
- Methods for correcting outdated and incomplete documentation.
- Procedures for archiving and accessing documents that are no longer relevant to today's projects.

- Definitions for documentation resources and competencies that adhere to project/position requirements, job descriptions and roles and responsibilities.
- Processes for rapid deployment of business critical documentation.
- Marketing and communication plan for outlined internal documentation processes and procedures to the IT community.
- In the analyses, workflow and document management products were divided into two categories: "enterprise" and "teamwork" solutions. Multiple resources were used to complete the analysis including The Gartner Group, the Workflow Management Coalition, the International Data Corporation, Image and Workflow Systems Program, and multiple media and educational resources.
- The emerging area of teamwork solutions was selected to provide a combination of web-enabled document management, workflow, and other groupware attributes suitable to the work of engineering, management and documentation teams. These solutions were deemed to be more flexible and at a lower cost than high-end enterprise systems.
- Base criteria were established for the teamwork automation solution, including:
- Limit the costs to $250,000 for an entire workflow system.
- Provide a browser-based system that works in the current desktop environments (which include Netscape and Internet Explorer browsers backward compatible to versions 3.x).
- Use current NT core services and domain design for the company.
- Review multiple teamwork, document management, and workflow packages to ensure automated processing of the document request and fulfillment process.
- Recommend, customize and implement a system that will allow for creation, change, archive, and deletion of documentation in a controlled manner.
- Provide a routing and notification system that allows for the implementation (and possible change over time) of custom forms, processes, users and workgroups.
- Provide for ease-of-administration for changes to processes, forms, document types, aging procedures, users and groups within the system.
- Enable escalation processes within the system that allow typical workflows to be bypassed with appropriate security.
- Ensure an easy-to-use system with minimal end user training requirements.
- Provide ad hoc and pre-defined reporting.

Technology Solutions

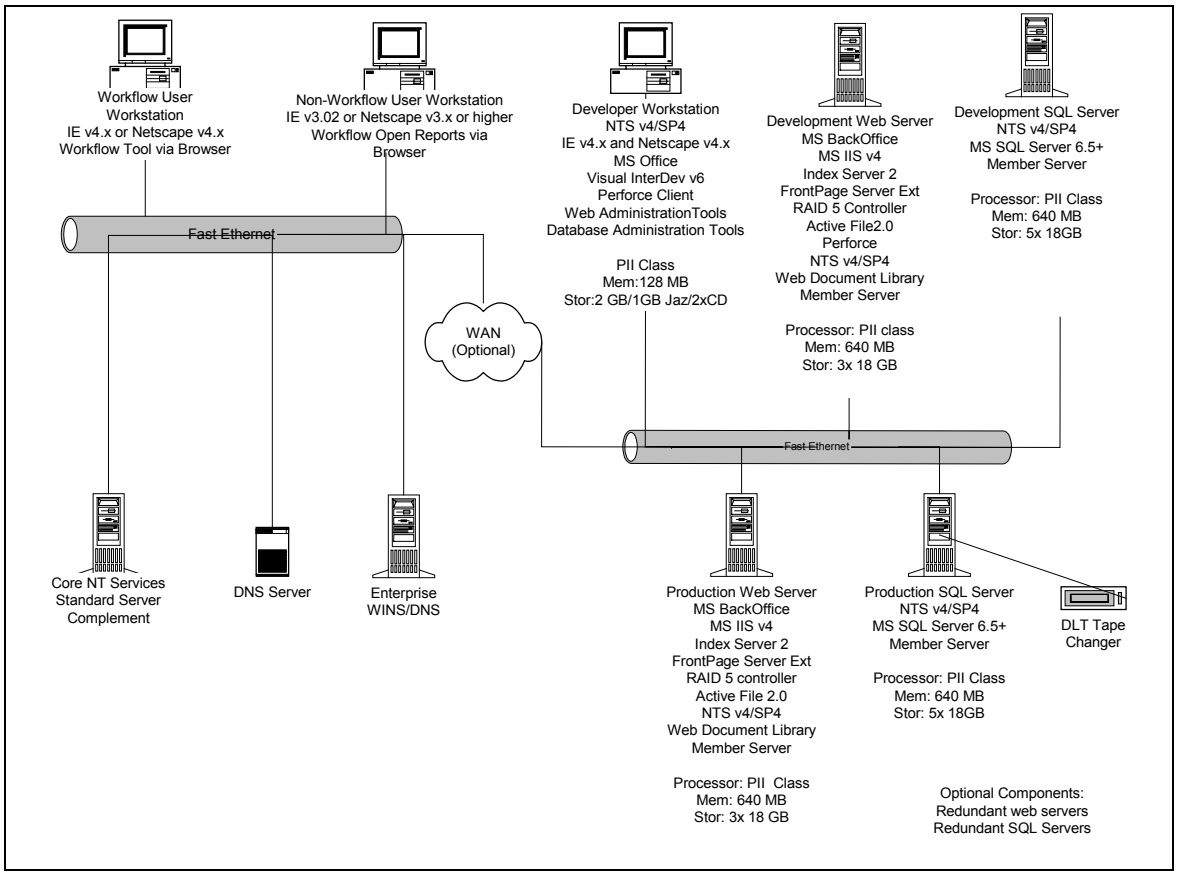


Figure 4. Application and Technology Engineering Chain

Conclusion

Axean Pacific's Web-Based Workflow and Document Management application provides customers with a tool that is easy to use and customize. In the case of the health care organization, it provided a cost-effective solution for addressing critical workflow, documentation, and accountability requirements. By implementing this system, the company was able to reduce its total cost of ownership and enhance its processes through:

- Defining, streamlining and automating manual processes thereby increasing productivity
- Instilling and tracking ownership and accountability by process participants
- Gaining better control over its documentation and associated processes

The implementation of Axean Pacific's Web-Based Workflow and Document Management application proved to be critical to the success of the company's key business initiatives.

If you are interested in learning more Axean Pacific and its services, please contact Victor Tayao (victor.tayao@axeanpacific.com) or visit our website at www.axeanpacific.com.