The Pennsylvania State University

Streamlined processes improve productivity across the campus

Situation:

- The Pennsylvania State University's many departments have been struggling to stay efficient using a workflow system that's 20 years old – and trapping its users in 20-year-old business processes. Individual departments that have sought their own solutions encounter added problems, such as increased task time, because of a lack of application integration. Form processing in particular has turned costly and wasteful. The University needs to find a cost-effective way to streamline processes.

Solution:

- Short term: Penn State is deploying *crossvision Business Process Manager™* from Software AG. Taking a pragmatic approach, Penn State is deploying the project in phases over 2006 and 2007.
- Long term: Tie the University's workflow system into a University-wide Web services hub based on Software AG's *crossvision Service Orchestrator™*.

Result:

- More than 70 different business processes will be re-engineered to increase throughput, efficiency and cost savings.
- Shifting from paper-based to Web-based approval processes will significantly reduce process times and free skilled employees for other tasks.
- Supply expenses, equipment depreciation and mailroom overhead will be reduced.
- Eventual use of Web services will allow back-end systems to be preserved or incrementally replaced while affording rapid adoption of modern user interfaces.

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Customer:

"Software AG is helping us realize our vision for this project: to transform the way we work by streamlining our business processes and adding flexibility."

Beth Hayes
Workflow Project Manager
Penn State

SOFTWARE AG®

Feeling the strain

Like many academic institutions, Penn State has been growing rapidly yet still relies on business computing systems that date from the 1970s and '80s. With over 16,000 full-time faculty and staff and more than 81,000 students on 24 campuses, the University needs to find a better way to adapt to changes and support a growing and complex institution.

Not surprisingly, the strain on its technology infrastructure is intensifying, especially on the homegrown workflow system dubbed EASY (Electronic Approval System).

"When we developed EASY, we tried very hard to mirror the paper form right on the screen," explains Beth Hayes, the University's workflow project manager. "So today we not only have a 20-year-old system, we're also using 20-year-old processes. And, as you can imagine, the way we need to do things today is not the same as it was back then."

Plenty of other departments — including human resources and payroll, business services, the corporate comptroller's office, the budget office and Penn State's 130 academic departments — find themselves limited by EASY and have been pushing initiatives that would deploy more sophisticated Business Process Management (BPM) solutions in their day-to-day activities.

"The University community let us know that the existing system simply was not meeting their needs," says Hayes. "Our business partners indicated that too much time is required to process forms, especially those that require supporting documentation. It may be a cliché, but time is money. We needed to find a way to streamline the processes."

One versus many systems

The limitations of isolated, stand-alone technology solutions had already become obvious.

The departments that had invested in them discovered that technical incompatibilities and a lack of integration with enterprise systems prevented them from interoperating with other departments. This actually doubled the work required to complete certain tasks. In the physical plant office, for instance, the office manager needed to double-enter all purchase orders into two systems to purchase equipment. This redundancy is what Penn State wants to eliminate.

The goal is to replace EASY with a single, University-wide solution so Penn State can benefit from lower costs, higher efficiencies and stronger security derived from a single set of interfaces for user authentication, authorization and data access as well as synergies that come from sharing business processes between departments.

Time for an assessment

The challenge: Build a single extensible workflow management solution with capabilities broad enough and diverse enough to meet *all* of Penn State's needs.

The University turned to Software AG and asked for an assessment of its business process capabilities and requirements of individual departments.

Software AG conducted a CustomerFirst Assessment, which included an extensive study and interviews with University personnel. The assessment concluded that the diversity of Penn State's environment and requirement set as well as built-in different languages running on multiple systems would make 'ripping and replacing' both expensive and risky.

Software AG's recommendations included:
- Analyzing the University's current technology and capabilities
- Making a business case to support a University-wide workflow management

system initiative based on Service-Oriented Architecture (SOA) concepts and Web-services technologies that allow working back-end systems to be preserved and/or incrementally replaced while affording rapid movement toward modern user interfaces
- Providing information to help Penn State make a 'build-versus-buy' decision

The resulting workflow management system roadmap had two main recommendations.

First, Software AG suggested Penn State adopt a standards-based, vendor-neutral 'Web-services-hub' approach to workflow management. Such an approach is key to enabling reuse of critical business functions and providing an integration framework across multiple operating platforms.

Second, Software AG suggested Penn State implement a BPM system rather than modify its existing workflow tool or embark on a custom development project.

Beginning with BPM

With the Web-services infrastructure vision recommended by Software AG, the University is positioned to take the first step: implement new-generation BPM that's able to manage dynamic processes, thus meeting the need for agility amidst ever-changing business processes.

Using Software AG's *crossvision Business Process Manager,* the solution provides:
- Flexible, human-oriented workflow features, including an ability to modify running processes, task-routing and escalations based on business calendars, and 'voting' capabilities to assist with collaborative decision-making
- Strong analytics with automatic recording of process events to an OLAP analytics database
- Process optimization features for actual and simulated data
- Extensive connectivity and integration, including Web-services interfaces

- Support for standards, including SWAP for protocol for starting sub-processes on remote servers, XPDL for process import and export, SOAP and Web-services protocols for interacting with external processes
- Application server neutrality — in particular, the ability to support a Linux implementation

Long-term solution: a Web-services hub

Even as the University begins phased implementation of its new workflow system, it is also planning to integrate the workflow system with a new Linux-based Web services infrastructure based on Software AG's *crossvision Service Orchestrator*. The University's other Web services, independently generated using the Smalltalk programming language, will also be integrated with this single, over-arching Web-services infrastructure.

Here's how the infrastructure will improve services management and efficiency:
- Direct support of XML will allow dynamic repurposing of data into multiple presentation formats, provide self-describing means for exchanging information, and deliver standard access to both structured and unstructured information
- Implementation of a Web-services-based architecture will enable universal access to all information systems and permits loosely coupled, granular components to seamlessly interact, thus reducing complexity
- Foundational use of metadata will give structure to data sources, processes and definitions by means of edit rules, layouts, business dictionaries and the abstraction of application data details

Such an infrastructure will include management and discovery of Web services and provides security, access control, authorization and an ability to store XML-based forms.

Something else is required to provide Penn State with the capabilities necessary to transform SOA into service-oriented *integration* — security, routing, validation, exception handling, persistence, audit trail and non-repudiation. An integration mechanism will enable users to query and pull data into front-office applications from back-end databases, custom applications and workflow systems — regardless of location, format or access technology.

This is accomplished by leveraging the proven constructs of intelligent data integration, service integration and BPM by means of a hub architecture — what Software AG calls a 'Web-services hub.'
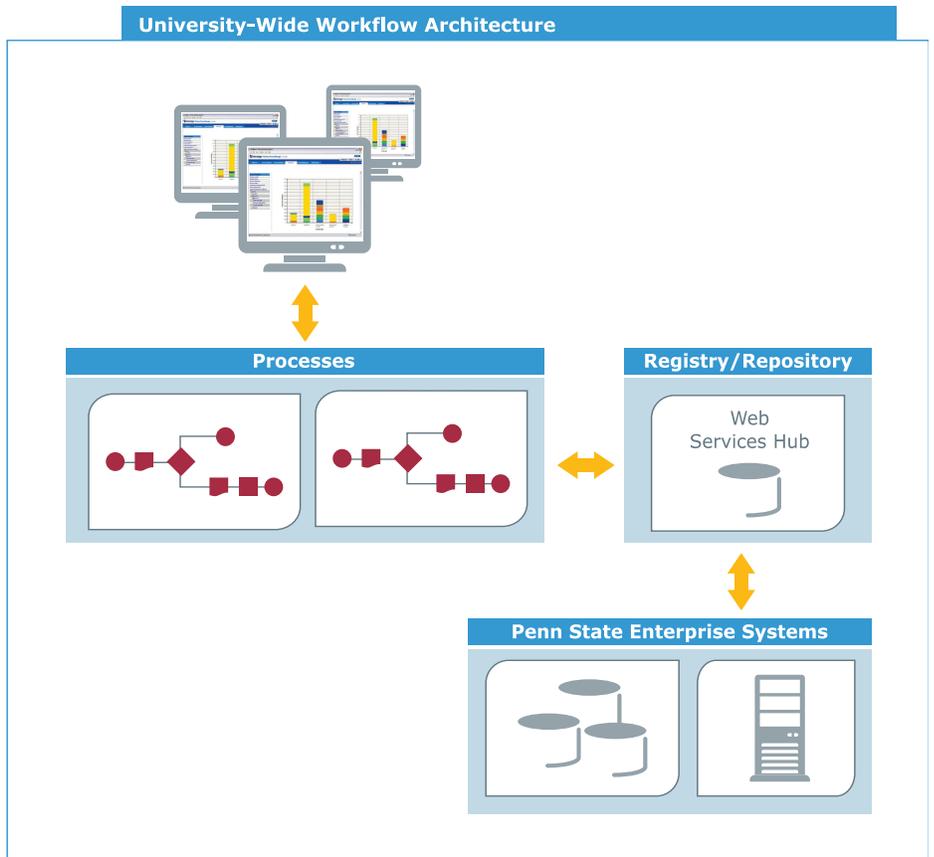
Test deployment underway

Heeding Software AG's advice to implement the workflow system in phases, Penn State's test deployment of the initial processes will soon be underway. Pilot deployments are targeted for dates throughout 2006 with production implementation targeted for 2007.

"We wanted to proceed cautiously — we had never done this before," says Hayes. "So we chose to start with processes that were low-stakes — not currently automated and not highly complex."

Penn State is beginning with a departmental business process supporting undergraduate student travel funds requests. Already, things are going well.

"By automatically capturing all the supporting data, the workflow management system makes a tremendous difference in the amount of time it takes to process a student travel request," Hayes reports. "A process that took two to three weeks can now be done in an hour."

University-Wide Workflow Architecture

Processes

Registry/Repository

Web Services Hub

Penn State Enterprise Systems

Penn State is re-engineering more than 70 processes to increase efficiency.

Five key processes in Penn State's Workflow System

1. Undergraduate Education Travel Request facilitates the dispersal of funds to eligible undergraduate students traveling to professional conferences to present research results. Re-engineering this process into workflow will:
   • Automate a paper-based process and reduce processing time from two to three weeks down to one day
   • Pull student information from the student database
   • Calculate financial contributions from participating departments
   • Apply financial funding caps based on policy

2. Sabbatical automates a paper-based business process for eligible University employees to request and be granted authorized leave for study or research. There are approximately 150 Sabbatical requests in an average year with a maximum of 190 in any year. The total size of the applicants' attachments may include up to 75 pages of printed text, placing a considerable burden on approvers. Re-engineering this process into workflow will:
   • Eliminate manual data verification performed by the Office of Human Resources
   • Automate data verification by using enterprise data from the Integrated Business Information System (IBIS) as the applicant creates a new form
   • Enable the applicant to track their application through the process, enabling them to know *where* in the path their request is, but *not see/view* actual recommendation actions
   • Significantly streamline the process within the November 1 – January 1 window

3. Purchasing Card authorizes an individual to be issued a purchasing card. The form is submitted by the department granting the authorization. Re-engineering this process into workflow will:
   • Combine two separate processes (adding and updating purchasing card authorization) into one
   • Eliminate a separate step to post financial data into the central business system

4. Workflow Role Authorization delineates the requirements for documenting those who are authorized to assign and approve role authorizations for various roles. Re-engineering this process into workflow will:
   • Automate a paper-based process, thus replacing the requirement for authorized approval cards (signature cards)
   • Enable near real-time updates to the central directory server with approved role and attribute assignments
   • Provide real-time, online audit capability
   • Significantly streamline the process from approximately one week to one day and eliminate multiple offices interacting with multiple systems

5. Employee Termination Form is currently an automated, mainframe-based process. Re-engineering this process into workflow will:
   • Meet a University directive to move business process to a Web environment
   • Combine functionality within a single process which results in a significant savings in time, efficiency and maintenance for the University

The importance of stewardship

Hayes also notes her internal Penn State customers are pleased and have become real believers in the benefits of an extensible workflow management system.

"Of course, this is a big shift in culture for the people who've been using the EASY system — some of them for the whole 20 years it's been around," she says.

"We meet that challenge head on. Each process at Penn State has someone who owns it, a process steward. We work closely with each of the process stewards, explaining the benefits of the workflow system. The first time out we were met with skepticism, but by the end of that presentation, we were being offered congratulations! Things are going very well."

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