



The Arlington Institute Arlington, Virginia

The Arlington Institute Deploys LegaSuite® BPM to Orchestrate Web Services for its SOA Application

For the United States government, collecting and disseminating key intelligence information has never been more important. Federal, state and local agencies are under immense pressure to serve as a knowledge center for citizens nation-wide. However, effectively acquiring, analyzing and sharing mass amounts of data is a complex process that requires a highly coordinated effort and sophisticated technology.

The Arlington Institute (TAI), a developer of government intelligence software, was contracted to create a government intelligence research application to collect, store, extract and analyze data for tracking global trends and potential unexpected events. Many government agencies currently running these research processes are heavily dependent upon manual processes to scour the Internet or classified data sources, clip articles and compile them into central repositories for dissemination and analysis. Technology used by these agencies to process the data often consists of uncoordinated toolsets with a plethora of proprietary data formats.

The Arlington Institute set out to create a coherent and all-encompassing system that would provide a collaborative environment, integrating a large number of third-party tools into an analytic workbench in support of the government analysts.

The Integration Challenge

The end-users of the application, knowledge workers and analysts, are responsible for processing vast amounts of data. To be effective, they need to organize, internalize and then transform huge datasets into a representation that facilitates their analysis. The components that constitute the end solution would need to perform most of this processing automatically.

In order to fully automate the entire research process, the end solution would need to integrate multiple pre-existing research tools and new automation components, along with human tasks and various human roles. In addition, the solution would need to be able to quickly change research processes as necessary to complete the task at hand and new needs over time. There were also requirements to integrate with multiple technologies:

- .NET based Web services
- J2EE-based Web services
- Databases
- Legacy applications (command-line driven applications, without a programming interface)
- User authentication and authorization mechanisms

Headquartered in Arlington, Virginia, The Arlington Institute (TAI) is a 501(c)(3) non-profit research institute that specializes in thinking about global futures and trying to influence rapid, positive change by applying newly emerging technologies to today's issues.



Finding the Right Technology

Initially TAI searched for an Enterprise Application Integration (EAI) tool that could integrate all the complex, disparate technical components that the end-solution would possess. In further developing their criteria, TAI determined that the end solution would expose the toolset as Web services using a service-oriented architecture (SOA).

The analysis process would be orchestrated across multiple tools and users, providing seamless transformation of data throughout the process. Any selected enabling solution would therefore need to accommodate:

- Multiple Web service standards (.NET, J2EE, SOAP, WSDL)
- The ability to transform data as part of the processing
- A role-based authorization model to assist in routing work across the people in the organization
- Customization and extension by end-users
- High availability
- Vendor neutrality

A variety of tools were examined, ranging from data transformation engines to full workflow solutions. During the selection process, the need for both a full workflow solution and a Web services orchestration tool became apparent.

After much evaluation, Seagull Software's LegaSuite BPM technology emerged as the leading choice for creating a comprehensive solution. LegaSuite BPM was selected for its:

- Platform Neutrality
- Vendor Neutrality
- API support, including Java, XML and WSDL interfaces to the function provided by the engine
- Ability to orchestrate Web services, as well as manage human workflow activities
- Support for scheduling repeated activities
- Ability to integrate disparate technologies through common infrastructure
- Capacity for easy changes on-the-fly
- Easy-to-use business process modeling tool
- Ease in integrating with existing authentication and authorization infrastructure
- Auditing and traceability of process execution

The LegaSuite BPM Solution

Using LegaSuite BPM, TAI was able to create DIANE, their Digital ANalysis Environment tool, which serves as a research automation solution. LegaSuite BPM acts as the Web services orchestration and workflow engine for DIANE. DIANE is used to automate dozens of critical research tasks providing government agencies and their agents with an efficient means of gathering, maintaining, analyzing and archiving current information across multiple applications, sources and people.

LegaSuite BPM links the individual Web services together that were required to create the robust research system, sequences the acquired data analysis (technical and human-based) and manages the transfer of control from tool-to-tool and person-to-person within DIANE.

DIANE also monitors data feeds using a variety of analytical tools; for example, the construction of an entity network from a data feed. Incoming data provided by a Web service is passed through an entity extraction engine (another Web service), which performs natural language processing to identify the people, places, organizations and countries that have been mentioned in the data. The resulting set of entities and the text identifying the relationship is then transformed and stored in a database.

The results are made available in the form of an i2 Analyst's Notebook document that graphically presents the results of the analysis by converting the structured representation from the database into an XML document, which is then bridged into Analyst's Notebook proprietary format for display.

Business Drivers:

- Build an application to automate entire research process
- Integrate existing research tools with new automation components
- Deliver the ability to change research processes quickly

Results:

- Deployed a comprehensive solution quickly
- Developed a solution that seamlessly runs and models business processes and handles exceptions
- Enabled TAI to improve staff productivity

Generating these complex process diagrams without DIANE would take anywhere from days to months, depending on the dataset and the analyst. With DIANE and LegaSuite BPM, these documents can be constructed almost automatically (the analyst still has to identify criteria for inclusion), and then be continually updated.

The time it takes to compile the information is now measured in minutes, rather than days. The analyst does not have to process all of the data, nor suffer the data entry task and associated attendant errors to get the information in a usable form.

By spending less time with poorly-integrated toolsets, better-quality analysis is delivered in a more timely fashion with less effort. By separating the business processes from the implementation of the services, the workflow used in the generation of the network can be quickly and easily updated to accommodate improvements in tooling or analysis methodologies, as well as easily enabling different modes of analysis.

Fast Results, Big Benefits

Using LegaSuite BPM as a Web services orchestration and workflow tool has allowed TAI to deploy a better solution with less effort than would have otherwise been possible. LegaSuite BPM provides the support to model analytic and business processes, run and monitor them and handle exceptions. Without LegaSuite BPM, TAI would have had to build or do without role-based collaboration in business processes, asynchronous processing of data, scheduling capabilities and auditing. DIANE would have been built on the alphabet soup of emerging XML standards, complicating the implementation and slowing the development schedule. With LegaSuite BPM, TAI has a robust mechanism to implement processes that:

- Are easy to use
- Improve the productivity of staff
- Perform well
- Avoid vendor lock-in

From a development perspective, TAI programmers spend less time integrating toolsets and more time improving the analytic capabilities of DIANE. The loosely-coupled services in the architecture married with LegaSuite BPM's ability to orchestrate the services provides a very fluid, dynamic implementation that is easy-to-build, -maintain and -extend. Operationally, LegaSuite BPM's ability to update process definitions without bringing down the system is crucial in meeting quality of service requirements for availability.



Seagull Software specializes helping companies gain more value from their existing legacy systems. LegaSuite® is Seagull Software's integrated platform of high-performance solutions that transform legacy applications into service-oriented architecture assets. LegaSuite includes modules for legacy integration, Web services generation, composite application assembly and business process management. More than 8,000 organizations worldwide use LegaSuite to integrate legacy systems with new, strategic IT architectures.

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