



(c. online)

## Getting on the same page

By John Moore

Published on September 15, 2008

Government managers are no strangers to the challenge of trying to combine data stored in different systems into a more useful composite picture. The task is even more complex because the systems housing this data were usually not built with flexibility and sharing in mind.

The emergence of so-called mashups represents a new take on this old problem. Mashups are Web applications that pull together select data and software functionality from two or more sources.

Mashups, considered a segment of Web 2.0 technology, come in two flavors: consumer and enterprise mashups.

A consumer mashup taps publicly available Web sources to create a new application. For example, Housingmaps.com, an early mashup, combines Google Maps with housing listings from Craigslist. Meanwhile, enterprise mashups can tap both external sources and internal systems for data.

In both cases, the mashups employ existing resources to create an application rather than building entirely from scratch. This approach addresses another long-standing government issue: software reuse. Mashups also let agencies take advantage of previous investments in service-oriented architecture. SOA encourages a segmented approach to software development, and those components — often developed as Web services — can feed a mashup.

Mashups can be quick and easy ways to create useful new applications, but they can also raise security and data integrity issues that agencies must address.

### Government use

Mashups have begun to surface in government agencies.

For example, the Housing and Urban Development Department uses the mashup approach in its National Housing Locator System. The system, developed in the aftermath of Hurricane Katrina, lets government users identify available temporary housing for people displaced by a disaster. It was recently employed to identify housing sources before the arrival of Hurricane Gustav.

HUD's locator system pulls in housing data that was previously isolated in various local, state and federal systems. The locator combines the housing data with other elements, including Google's map application programming interface (API) and internally developed geocoding services.

### Mashups and the cloud

Mashups have begun to converge with another nascent technology: cloud computing.

Cloud computing provides software, storage and computing capacity as a service. Examples include software-as-a-service offerings such as Salesforce.com and computing resource services such as Amazon.com's Amazon Elastic Compute Cloud.

"Mashups and cloud computing are separate but complementary trends," said John Cimral, chief executive officer of Kapow Technologies.

Vendors such as Kapow say their mashup wares can play a role in the cloud. Cimral said mashup technology can help migrate and share structured and unstructured data in the cloud.

John Crupi, chief technology officer of JackBe, said the company is testing its mashup platform on Amazon's cloud.

He said customers could potentially push terabytes of historical data to the cloud and use mashups to analyze that data.

# Federal Computer Week



(c. online)

“The integration of multiple services into an application allows for a [geographic information system] application to bring together basemaps, operational data, and analytical services to create simple to complex applications that provide information and solve common tasks,” said Lynn Allen, HUD’s deputy chief information officer for business and information technology modernization.

Users of the locator system can select an area on a map and receive more detailed information, Allen explained.

Mashups are “a relatively new technology that extends the capabilities of GIS,” she said. In a different twist on data aggregation, a tool called One-e-App, sponsored by the California HealthCare Foundation, uses mashups to help enroll low-income families in local, state and federal health and social services programs. The Web-based application allows people to fill out a common application that they can submit electronically to various government agencies’ programs. One-e-App is used in Arizona, Indiana and 10 California counties.

The mashup approach lets families apply once for a range of programs rather than fill out an application for each health or social service, said Sam Karp, vice president of programs at the California HealthCare Foundation.

“We have such a disaggregated environment,” Karp said. “What One-e-App has done is build interfaces to these various government systems.”

Agencies involved in intelligence and homeland security have also adopted mashups. The Defense Intelligence Agency’s Overwatch project uses the technology to pull in and analyze intelligence data. Similarly, the Navy’s Critical Infrastructure Protection Center (CIPC) collects open-source intelligence data from more than 300 sources and fuses that with internal content.

## **Improve access, save time**

From the user’s perspective, mashups provide one-stop access to data from multiple sources.

Sean Robertson, federal manager at Kapow Technologies, said mashups let agencies streamline data access. Kapow provides software for creating mashups and counts the CIPC among its customers. “An analyst needs to go to a dozen internal sites and many external sites to gather information and run it through an analyst tool,” Robertson said. “If they have to go to different sources individually and cut and paste the data back into the analyst tool, it is not very productive.”

A mashup “provides a unified view,” said Suresh Chandrasekaran, vice president of marketing at Denodo Technologies. Denodo focuses on enterprise data mashups and works with customers such as One-e-App.

Karl Burkheimer, tech warrant for knowledge management and dissemination at CIPC, said mashups, which are browser-based, provide a “common layer for presentation that was missing before.” Previously, a dedicated or proprietary client that connected to a back-end data source was the typical presentation approach, he added.

Mashups can also trim development time. A mashup’s ability to reuse data and software services contributes to faster application implementation because developers can tap existing APIs to assemble a mashup.

# Federal Computer Week



(c. online)

One-E-App uses a U.S. Postal Service API that lets the system verify applicants' addresses via a USPS database, Karp said. Use of the Google Maps API lets One-E-App generate maps to help applicants reach nearby health care providers.

HUD's use of public APIs and existing software components developed internally cut the new application's development time significantly, said Ramesh Ramakrishnan, division director at Citizant, which developed the department's housing locator system.

"Why reinvent the wheel when there are a lot of available services that can be used?" he asked. Citizant, a technical solutions provider, built the mashup-powered HUD system in 45 days, Ramakrishnan said. The creation of a national housing database, once under consideration, would have taken two years, he added.

## **Mashup issues**

However, not everything about mashups is easy.

For example, the method might require a push from above to get things rolling. Bob Gourley, a former DIA chief technology officer who now runs a blog called CTO Vision, advised those planning mashups to cultivate high-level executives.

"This kind of thing is not the normal way of doing business," he said. "The executive leadership needs to be engaged and stay engaged."

Technical hurdles can include data sources that lack ready-made interfaces, so workarounds are needed. When APIs aren't available, the One-e-App system pulls data displayed from an applicant's original online application and uses that data to populate the screens of the API-less system. Karp said this kind of screen-scraping approach can be used to generate Women, Infants, and Children or Earned Income Tax Credit applications

Security considerations also arise with mashups. A mashup needs to "leverage the security capabilities of the enterprise," Gourley said. "You need a mashup provider who can look into your global directory — an LDAP server or other directory mechanism."

John Crupi, CTO at JackBe, said his company's mashup platform plugs into an enterprise's existing single sign-on and identity management solutions. In the case of Overwatch, JackBe's mashup-building technology plugs into DIA's public-key infrastructure.

Another issue is the integrity of the data contributed to a mashup.

"Agencies are faced with having to ensure that the information and other data that they provide remains the authoritative source of the information and data," wrote Jose Alonso, e-government lead at the World Wide Web Consortium, and Kevin Novak, co-chairman of the consortium's eGovernment Interest Group, in an e-mail response to questions.

Data provided to others for display in mashups cannot be considered authoritative because the agency can no longer be sure that the data maintains its original nature, they wrote. That is true unless there is a legal agreement between the parties to preserve the data, or the agency manages the information sources and provides the mashups, they added.