Technology Strategies Notes Revisited

Volume 2, Special Issue 2
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Office of Technology Strategies (TS), Architecture, Strategy & Design (ASD)

A VA Executive's Guide to Past Notes: Web Services and Applications

INTRODUCTION

This TS Note revisits three previous TS Notes and combines their highlights into one document. This provides readers one location where they can find overviews, examples and benefits of a larger IT concept, and use them in strategic or investment decisions. The TS Note series has covered three topics in Web Services and Applications over the past year: Web Service Layers, Applications/Service Layers, and Rich Internet Applications. This TS Note will define and give background information on each of these concepts, and aligns the associated technologies to the VA's IT Vision.

BACKGROUND

Web Services support the business value of treating all information as an enterprise asset. Using modern Web Services to connect applications to data ensures information is discoverable, accessible, and usable by the rest of the enterprise. Web Services act as a connector between data and the applications that use it, allowing a user of a Web Service to access existing applications and data via the Internet. Ultimately, this allows organizations to reuse existing applications and functionality to solve business problems rather than taking the time to build in-house applications. Not only does this save an organization time and money, but Web Service-enable applications also improve information security and enhance information agility across internal and external business units.

Web Services exist as "stacks" with multiple layers. In general, there are three layers: Presentation, Services (or Application), and Data. The interactions between the layers that make up the Web Service allow users to access, use, and store the data they need to perform their business functions.

- Presentation Layer – the components that implement and display the user interface and man-age user interaction.
- Services (or Application) Layer – a set of "action pages" that interact with one or more data stores and manipulate or change data based on user input—the part of a modern application that actually does all the work.
- The Data Layer – the database service where applications store data.

ENTERPRISE SERVICES

Enterprise services may be developed as part of a specific project, but must be designed to operate independent of any specific application. In VA, the majority of our data is either created, read and modified by many different applications, or, (unfortunately) duplicated by them. This is because many different VA users have similar business needs. Therefore, it is critical that all services be built as potential "shared services."

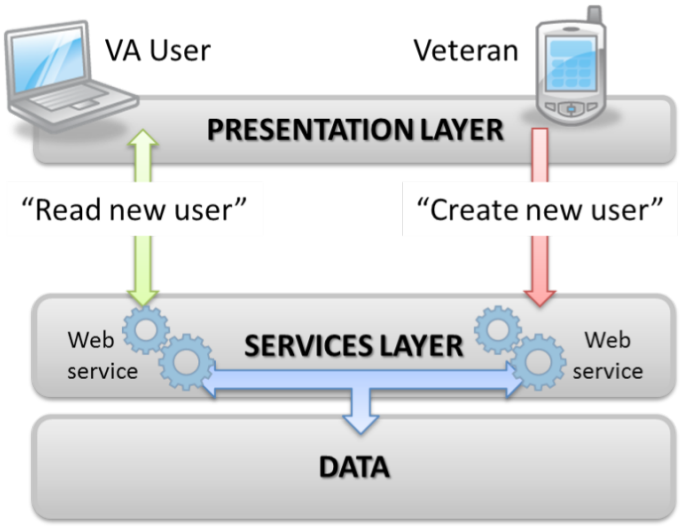

Figure 1 – Three-Tier Application: VA user reads

There are a couple types of services in the services layer:

Create, Read, Update and Delete (CRUD) Services: These are simple interactions between Presentation and Data Layers via the Services Layer. One user may create, read or modify (including delete), and another user can view those changes when the record is accessed.

Composite Services: These perform smaller sets of tasks within a larger process. For instance, if a user requests information, a composite service will authenticate the user with a separate data store before a CRUD service returns the appropriate information, ensuring they are authorized to view that information.

ENTERPRISE RICH INTERNET APPLICATIONS (RIA)

In a constantly evolving customer and patient-centric environment, applications must adapt to how Veterans and VA users access, view and update VA information.

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Technology Strategies

Defining OI&T's "To Be" Technology Vision

The TS office within OI&T's Architecture, Strategy & Design (ASD) interacts with the ASD pillar offices, multiple stakeholders within OI&T, and strategic offices across the enterprise. TS works closely with IT and business owners to capture business rules and provide technical guidance as it relates to Data Sharing across the enterprise, specifically for interagency operability.

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Web Service-enabled applications are not only easier and cheaper to develop, but they offer increased functionality and can be accessed on any device. The continuing innovation in website design provides the basic background for RIAs. Static websites (as they were when in the early days of the Internet) are basically pre-configured content displayed in a browser on a web page unconnected to other information available to the same web server. Dynamic websites display multiple sets of "pages" or information in the same window, and allow users to interact with the display as well as the information.

Plug-ins, Extensions, Frameworks

One key component of a RIA is the browser plug-in, which contains the application's software framework, runs off the client browser and defines the rich graphics or interface for a web page. Microsoft Silverlight is a RIA that uses a plug-in to launch a streaming media player within the browser. In recent years, extensions have become more popular than plug-ins. Extensions offer richer functionality by modifying or enhancing the web browser's code. The Google Chromecast extension modifies the Chrome browser to allow users to "cast" tabs to external displays. Newer dynamic web and RIA frameworks have developed ways to provide rich functionality without plug-ins or limited extensions, including HTML5, jQuery, and AJAX.

SERVICE LAYER BENEFITS

Legacy applications built without a "separation of concerns" into different "layers" rely on multiple point-to-point connections to other applications and data stores. This makes modifying or adding new functionality expensive, time consuming and complicated.

Applications that use services can simply mix and match different services from within the Services Layer or change the sequence in which they call them, to rapidly provide users with new and different capabilities. Additionally, new applications can be built much more rapidly by creating new Presentation Layers that reuse existing services.

The benefits associated with service-enabled applications includes:

Decreased Time and Cost

The Services Layer provides the enterprise with a set of reusable services, which modern applications access to perform any number of necessary functions to provide capability to users.

Increased Information Agility

Services allow an organization to access more of its own data, and enable external applications to share or use common functionality and data.

Improved Security

Service Layer security offers an agile approach that focuses on the communication between systems (messages), and on specific services that interact with information (end-to-end). The Services Layer can orchestrate multiple security services for one interface (e.g., authenticating users as well as encrypting data).

BENEFITS TO VA

The VA's IT vision is, in part, defined by the need to support "any device, anywhere, anytime" for VA patients, customers, staff and partners. As such, browser-independent applications (which describes rich internet applications or dynamic websites) form one of the 12 key attributes of the IT vision, which states that "enterprise applications [must be] built as dynamic websites that adapt to how browsers need to translate and display information." The emphasis on browser and device independence features across the Application Technology category, including development tools, software engines, and user interfaces.

In the evolving healthcare and benefits environment, users are increasingly relying on a diverse set of platforms, web browsers, and mobile devices. This means applications must be accessible to any user's preferred method of access. Further, increasing demand for telehealth and mobile health apps can be met with RIA and dynamic web technologies, like those discussed in this note. Richer web applications, dynamic websites, and overall device or browser independence are necessary investments as VA adapts to this changing environment to meet the needs of Veterans.s

If you have any questions about Web Services and Applications, don't hesitate to ask TS (AskTS@va.gov) for assistance or more information.

Check out earlier TS Note editions here

(http://www.techstrategies.oit.va.gov/docs_ctsnotes.asp).

Rich internet applications use the web service stack to provide additional benefits and features to web applications, including:

Interactivity – direct interaction (e.g., drag-and-drop features) and seamless user experience across devices.

Performance – RIAs use client for local processing, leading to faster processing speeds and improved server performance.

Security – RIAs automate security updates, as well as run in secure sandboxes separate from client machines.