



Meridian Systems White Paper

The Business Value of a Web Services Platform to Your Prolog User Community

A white paper for project-based organizations that details the business value of Prolog® Connect, a new Web Services platform extension for Prolog Manager. Learn more about this new technology and how it can improve project team collaboration, create better interoperability with other business systems, and increase the return on your Prolog investment.

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Introduction

Economic and competitive pressures are demanding that today's project-based organizations get more return from their existing technology investments. According to the Aberdeen Group, a recent survey of technology executives found that a top strategy for increasing this return among "Best-in-Class" companies was to integrate desktop technology tools with enterprise applications in order to improve productivity¹.

This perfect storm of business drivers combined with enabling technologies is driving the development and utilization of Web Services platforms as a way for project-based organizations to get more from their project management solutions.

This paper provides a detailed understanding of how project-based organizations, including top ENR ranked construction and engineering firms, regional building owners and contractors, as well as public agencies, can gain significant business value from a Web Services platform, specifically with a new product from Meridian Systems called Prolog Connect.

IT professionals, business and operations executives, and construction and real estate teams will learn the key differences between web-based solutions and Web Services platforms. Specific examples will show how Prolog leverages a role-based application strategy pioneered by Microsoft called Office Business Applications (OBAs).

The Prolog Connect solution is how Meridian Systems is delivering the value of Web Services to the Prolog user community today. With Prolog Connect now available, we encourage project-based organizations to understand the capabilities that a Prolog Web Services platform can provide, as an integration mechanism for extending Prolog to other internal business systems, and as a collaboration technology that improves project team and supply chain productivity.

For more information, readers can visit: www.meridiansystems.com/products/prolog/connect/.

Web Services vs. Web-Based: What's the difference?

While "Web-based" was introduced early on in the Internet lifecycle, the truth is that today, the capabilities of the Internet are so much more powerful that this term has become far too narrow to accurately describe its latest advances.

The term "Web-based" is used to describe an application that is *accessible* on the Internet through a browser. While the anytime, anywhere 'accessibility' that the Internet provides is an advantage, the trade-off has usually been that "Web-based" solutions delivered only limited functionality when compared to their more robust client/server counterparts. This is mainly due to limitations and variations between browsers used to access the applications.

Wikipedia defines Web Services as "allowing businesses or users to exchange data over the Internet between applications and different platforms, hence interoperable 'machine to machine' interaction, where XML (extensible markup language) is used to code and encode data."

¹August 2008 - The Aberdeen Group - Two Worlds Converge - Enterprise Applications Meet the Desktop.

Essentially, this means that a Web Services platform can expose functionality and data to businesses, systems and end users over the Internet in a safe and secure manner. Web Services permit multiple applications to connect to one another and share information, regardless of location, type of device or operating system, including the technologies used to build them.

For project-based organizations using Prolog, having a Web Services platform allows functionality like project budgets, contracts, change orders, schedules, submittals, RFIs and daily logs to securely integrate with your other applications and device platforms over the Internet.

Walking through a few examples quickly demonstrates the power of a project management system built on a Web Services platform:

- A construction superintendent working for a general contractor uses a mobile phone to call a recording service that converts his voice message into XML data; this data is securely sent over the Internet, automatically creating a new RFI or daily log in Prolog.
- While traveling, a construction vice president of a regional hospital system uses pivot tables in Microsoft Excel 2007 to connect to his organization's central project management database. He can instantly see up-to-date budget, cost and variance data on all ongoing projects. He can manipulate this data using Excel graphing tools, and then share this information with the hospital board.

In both examples above, the project management data is located and centrally managed as one database on a Web Services platform, with requested data securely transported over the Internet. Each user can access the data according to their security permissions, using a device or desktop application related to their role (such as a spreadsheet application or a mobile phone).

How Web Services Works

Prior to software vendors adopting Web Services as a technology platform, integrating multiple systems together was challenging due to the proprietary interfaces that each system employed. As one software system is updated, others would also need updating to ensure integrations continue to function properly. When an organization implements solutions from multiple vendors, and has legacy applications more than a few years old, the challenge becomes even more difficult to manage.

To achieve better interoperability across systems, there needs to be a common language spoken between applications. Consider the example of the common telephone system — as you pick up the phone and dial someone, there is a handshaking process, or common 'protocol' that occurs between telephone systems that establishes a connection and passes your voices back and forth along the physical line.

This analogy is similar to the "http" protocol, the backbone of the Internet (Hypertext Transport Protocol), that enables you to request a specific web page using a traditional "Web-based" browser application. This request is transported in an HTTP packet to a web server, where the requested web page is assembled and transported back to your browser in another HTTP packet. When your browser receives the requested page, it appears in a visual format pre-determined by the application, and you are forced to receive all of the data on the page.

Instead of providing entire web pages to a user's browser, a Web Services platform can provide discrete pieces of data to any application that makes a request. So rather than displaying pre-determined budget

summaries in a browser, raw project data can actually be transported straight into Excel, and displayed as a chart, graph or a pivot table. Additionally, Web Services can provide a mechanism to both receive data, and to initiate a command; for example - to create a new RFI.

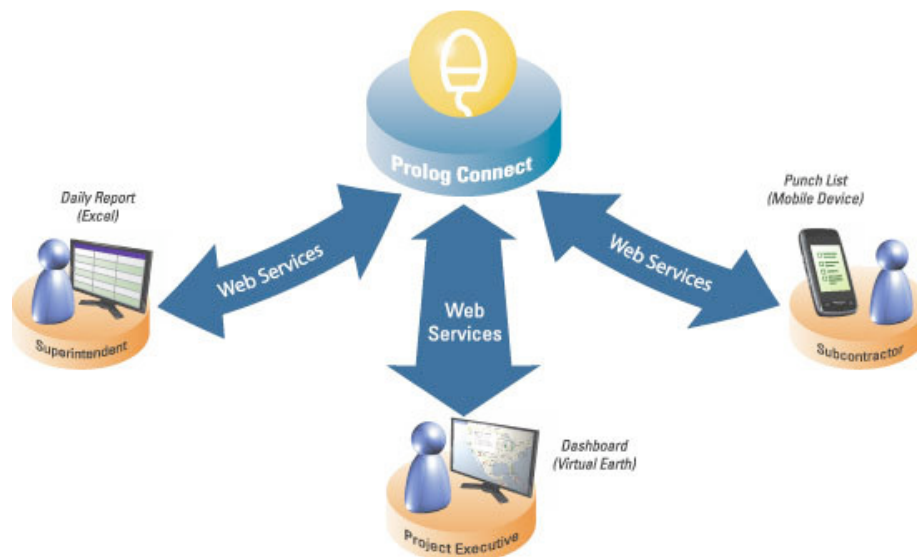
With Web Services, both the initial request for data and the data transported back are wrapped in an XML format. XML is simply a standard way of representing structured text. If we go back to the phone analogy, establishing the telephone connection isn't enough to have a meaningful conversation, the participants need to speak the same language to be understood. XML is the common language spoken between two Web Services systems.

Improving Interoperability with Role-based Applications

The adoption of Web Services platforms is becoming more prominent because of their ability to allow role-based access into an organization's enterprise systems of record, such as CRMs, ERPs, and PPMs, or project management systems. As hundreds of users are rolled out onto one project management software system, the CIOs of these project-based businesses are concerned with user adoption.

Traditional software applications today come with one "general purpose" user interface for everyone — whether you are an executive, project manager, scheduler, engineer or administrator. Rather than mandating that all users access a project management system using the general-purpose, standard software interface, Web Services empower organizations to develop role-based applications that create multiple, customized interfaces into a software application tailored to a user's work role or task.

This role-based interface approach becomes critical, because project team members use project management systems differently and have varying ideas about "ease of use." Some people prefer browser interfaces because they are on the road; some prefer Microsoft Excel because they crunch numbers all day long; and some prefer Microsoft Outlook and SharePoint because they are familiar systems they use all day long.



Prolog Connect enables the convergence of enterprise applications with desktop productivity tools such as Microsoft Excel, Word and Outlook to create Office Business Applications (OBAs) that make it easier for users to interact with Prolog.

Role-based applications can improve interoperability by essentially merging enterprise systems, such as a central project management solution, with familiar desktop productivity tools that are used on a daily basis. This convergence helps organizations to improve software usability and end-user adoption, reduce technology training costs, break down disparate data silos across departments, and ensure that critical project data is centrally managed in one system of record.

Additionally, Aberdeen Group has completed research that indicates that organizations will see not only improvements in user productivity, but also in corporate performance through this convergence.

"Converging enterprise applications and desktop tools such as those found in Microsoft's Office Suite make data needed for decision-making more easily accessible. Meridian Systems is amongst the first enterprise application vendors to deliver on this new technology wave sweeping towards convergence. Ultimately, from the end user's perspective, the goal is to improve personal productivity, in the hope that this will translate to corporate productivity. It's about getting more knowledge workers in a company operating from a single consolidated source of information.

The key value of this strategy is to reduce training costs, foster better user adoption of enterprise applications, so CIOs can rest assured their ERP-like investments will be successful. The key to wider adoption of enterprise applications throughout the enterprise is to make them easily accessible, intuitive to navigate and perhaps even transparent to the users that they are using these applications. By providing easy access, easy analysis in a familiar setting, while keeping users captive within the secure enterprise environment, you get the best of both worlds."

Cindy Jutras, VP & Group Director, Aberdeen.

With Web Services platforms, organizations have more deployment flexibility than just simply rolling out one mandated "general-purpose" interface that comes standard with any product.

Microsoft Office Business Applications (OBAs)

The most common way to realize the value of a role-based application strategy is through the development of Microsoft Office Business Applications, or OBAs. Microsoft embraced and pioneered their role-based application strategy (or 'composite application' as they call it) in versions of Microsoft Office 2003 and 2007. In both these offerings, Microsoft created the ability for Excel, Word and Outlook to support Web Services platforms. As a result, these applications can securely send and receive XML data via Web Service requests to Prolog, bi-directionally over the Internet.

The use of OBAs is a different process from the simple "import and export" feature in Excel. For example, when opening Excel, instead of retrieving the data in an .xls file, you connect securely over the Internet to Prolog. From within Excel you can create, read, edit or even delete Prolog data based on your Prolog security permissions.

In our regional hospital example on page three (3), the construction VP is using Excel 2007. In this case, a customized Excel OBA can be created, which requires the VP to enter his Prolog credentials ensuring he views only authorized data. Once authorized, the Excel OBA pulls specific budget details for each project

from the Prolog database. Utilizing Web Services, Prolog wraps the data up in XML, and securely sends it back to Excel over the Internet, where it is displayed in the format specified by the author of the spreadsheet. With a fast and stable Internet connection, this whole operation only takes seconds.

OBA's can essentially be thought of as Microsoft Office documents that have been configured to talk to a Web Services platform in just this manner. OBA's enable end users to leverage the familiar desktop productivity tools they are comfortable with to manipulate project data, while allowing corporate management to keep all project data centralized and secure in a 'single source of truth' database.

Prolog Connect as a Web-Services Platform

Prolog Connect is a new product from Meridian Systems that provides a Web Services platform extension for Prolog Manager. As a result, Prolog Connect permits applications and people to securely connect and share information over the Internet regardless of location, type of system or technology. Prolog Connect speeds project delivery by allowing organizations to more easily integrate Prolog with enterprise applications, and to improve user productivity through the use of OBA's that connect to a centralized Prolog database.

Prolog Manager is a robust construction project management solution with a powerful and flexible user interface. It was designed to serve the needs of a wide variety of users, from executives to project managers to engineers to data-entry clerks. Prolog's powerful interface is a great asset to project managers and other serious users, but requires light users and external supply chain contributors to learn new processes and to be trained on its functionality. An organization can become challenged on how to efficiently support the various and unique work processes, technology skill sets and data devices that span its entire project ecosystem.

With the introduction of Prolog Connect, Meridian Systems now provides a Web Services platform extension that enables any application or device to communicate with Prolog over the Internet without directly exposing the Prolog database, avoiding security issues.

This new level of interoperability can impact Prolog users in a variety of ways. Here are some quick examples:

- A simplified Daily Work Journal form can be provided in Microsoft Word or Excel for use by a Superintendent to input jobsite details.
- An Excel document can be used to update punch list items on a tablet PC as the inspector moves from room to room.
- The Project Manager can use Microsoft Outlook to view and sort through this week's RFIs.

To illustrate even more possibilities for interoperability, let's refer back to the first project management scenario described on page three (3) of this paper. In this example, the superintendent called a voice recording service and left a voice message that could have read something like "New RFI. Subject missing drainage specs." Using voice recognition software, the service transformed the message into XML data. The XML data is then passed over the Internet to Prolog Connect via Web Services. Prolog Connect un-wraps the XML data, and sees that it is a request to create a new RFI. It follows appropriate security permissions and creates a new RFI record in the Prolog database.

Prolog Connect affords project-based organizations with similar opportunities to integrate Prolog project data with internal technology systems, such as financial applications. For example:

- Instead of using Prolog Manager to enter invoices, an invoice payment clerk could alternatively use a custom desktop application. By entering in the vendor's Prolog ID number, that vendor's financial history is pulled from the accounting system. Payment terms for a new invoice can automatically be set based on the vendor's credit worthiness. Then payment of the invoice can be recorded in both Prolog and the accounting system with a single mouse click.

Another interoperability scenario supported by Prolog Connect is to improve workflow on a manual process that normally requires several steps to complete, and replacing it with a single automated operation. Say an activity takes five isolated steps within Prolog Manager to execute. A customized interface can be created that collects the necessary data from the user and initiates each step in the process, one after the other, automatically.

Prolog Community Scenarios Leveraging Prolog Connect

The combination of custom developed OBAs and a Prolog Web Services platform allows Prolog organizations to create several potential scenarios to streamline business processes and improve user productivity. Imagine the following development possibilities:

1. Many organizational users have Outlook open on their computers throughout the day. From directly within Outlook, these users could navigate to and update project management data like contracts, change orders, schedules, and correspondence, while simultaneously keeping all project management data centrally stored at the enterprise level. Outlook can be used as a real-time interface in to project management data, which requires less training and encourages end user adoption.
2. If an organization has deployed Microsoft SharePoint, it can set up portal pages that read project management data in real-time. Within the SharePoint user interface, users can access data from other applications and the project management Web Services platform at the same time.
3. After creating and editing contracts all day, a contract administrator could open Excel, connect over the Internet using Prolog Connect Web Services, and create, update and delete multiple contracts stored within Prolog. Others could use the same Excel OBA template to review and make modifications to these contracts as well, and then automatically update the Prolog data instead of storing multiple spreadsheet files.
4. Remote locations with limited Internet connectivity make offline functionality a requirement. A project manager could use an Excel OBA to connect to the Internet and download the latest project punch list from Prolog. After traveling to the disconnected jobsite, the project manager can manually update punch list items in Excel offline. After returning to the main office, and once connected again, his changes are updated automatically into Prolog.
5. Site superintendents need to complete daily logs at the end of each day. Using a customized Excel OBA, they are only asked for specific information to be tracked on that project. Using Web Services, Excel makes requests to Prolog to create a new Daily Details record, a new Event record, and a new Daily Work Journal for that day. So rather than navigating multiple Prolog Manager forms to complete the day's events or remember which fields are relevant, superintendents only need to learn a single Excel data entry page and click a single button.
6. Collaborating with external supply chain vendors is challenging because these companies don't want to learn another project management system. Organizations that rely on contractors and

subcontractors can allow their vendors to use Excel, to securely connect over the Internet and create their monthly invoices using a predetermined schedule of values.

The combination of Prolog functionality deployed on a Web Services platform creates any number of possible interface technologies or custom applications that can be created. The examples above illustrate potential scenarios of how Prolog customers and Meridian technology partners can extend the Prolog solution in a way that best suits their organization.

Summary

While the construction and capital building industries continue to grapple with improving interoperability and productivity across their organizations, the capabilities of Prolog Connect as a Web Services platform delivers a key technical ingredient to start solving these challenges right away. The business value of Web Services to your project management community is no longer a futuristic concept, but a reality today.

Business value summary:

- Realize flexible integrations between Prolog Manager and other internal and external systems.
- Connect Prolog project data to other software systems via the Internet in a secure manner, without directly exposing access to the Prolog database.
- Access Prolog data anytime and anywhere, while not tying up users behind corporate firewalls; allow unconnected users to perform Prolog tasks offline, and automatically synchronize at a later time.
- Leverage Microsoft Office Business Applications (OBAs) to provide familiar interfaces to end users and supply chain contributors, resulting in reduced training and higher user satisfaction.
- Engage with supply chain vendors by allowing these organizations to automatically integrate their data directly into Prolog.
- Improve data accuracy through role-based interfaces into Microsoft Office applications, allowing users to work how they want to, while keeping critical project data in one system of record.
- Improve user adoption and software ease of use across your organization, ensuring your Prolog deployments are successful.

Meridian Systems learned quickly from experience the business value that a Web Services platform can provide with its launch of Proliance[®] software in 2004. Proliance is an infrastructure lifecycle management application that was built entirely on a Web Services platform for large enterprise customers that were demanding better interoperability and customizable integrations for their diverse project teams and vendor communities. Proliance customers include commercial building owners, construction and engineering service firms, and public sector agencies that are today actively using many of the user scenarios examples defined above.

Prolog Connect, released in December 2008, now allows all existing Prolog customers to benefit from these same technologies. The Prolog Connect Web Services platform delivers more to your end users, IT staff and external supply chain participants, far beyond the capabilities of traditional "Web-based" applications.