

# Application Modernization A Business Case for Enterprise RIA

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The last year has seen considerable excitement in a new breed of web applications based on Rich Internet Application (RIA) technologies. Most of that excitement has been focused on consumer facing applications like Google Maps and mail innovations that have been driven by the hundreds of Ajax frameworks. However, as enterprises begin to examine how RIA technology can factor into their efforts to modernize legacy applications they are realizing that the Ajax approach has serious performance and security shortcomings. A category of RIA technologies that offer enterprise performance, scalability and security is emerging. We call this category Enterprise RIA, which is where Curl competes along with Adobe Flex/AIR, and Microsoft Silverlight.

Critical to successful application modernization is construction of a meaningful business case. While there are unmistakable benefits of web based delivery vs. client-server or high vs. slow performance the question remains how to quantify those benefits into real business value.

This paper will define the characteristics of Enterprise RIA platforms and examine how to construct a business case for their use in application modernization.

## *RIA as a category*

RIA has emerged as a category and analyst groups such as Forrester have been conducting various surveys and studies to quantify their benefits.<sup>1</sup> What they are finding is that there is a spectrum of RIA technologies that satisfy a range of needs from simple B2C to complex B2B applications. RIA for the enterprise differs significantly from RIA for consumer-centric applications. While sites such as Google or Yahoo handle very large numbers of users, the interactivity with business-critical databases and existing legacy applications is not a requirement. Enterprise RIA focuses on Fortune 1000 companies who spent a lot of resources during the 1980's and 1990's building client-server applications using the rich user interface of desktop clients such as Windows. Examples here range from custom-built applications to packaged applications such as those from vendors like SAP, and Oracle. Motivating this community to switch to a web-based GUI platform has been very slow, however critical to modernizing these applications is making a compelling business case.

<sup>1</sup>“The Business Case For Rich Internet Applications”, Forrester Research Report by Ron Rogowski, March 12, 2007

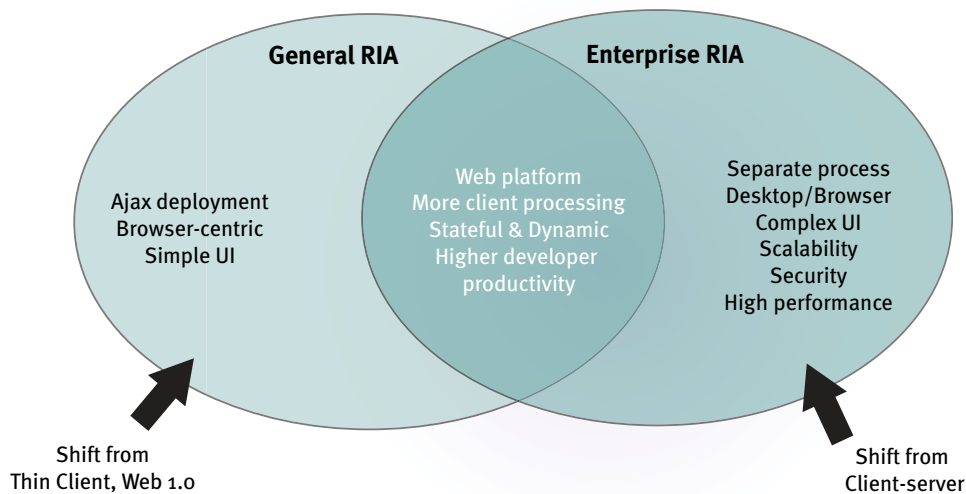


Figure 1 - General RIA vs. Enterprise RIA

Figure 1 illustrates General RIA as driving a shift to add more interactive and dynamic features to simple thin client Web 1.0 applications. On the other end of the spectrum Enterprise RIA is driving a shift from client-server applications that require high performance, scale and security to web delivery.

### Requirements of Enterprise RIA

The key requirements for enterprise RIA are as follows:

- **Complex graphics and reports** – a customer in the GRC (Governance, Risk, Compliance) space needs to display complex graphics with lots of details for the user. With minimal clicks, the user gets all the relevant information for decision making. This may include 3D graphics with animations and drill-down functionality.
- **Large Data Sets** – Enterprise applications deal with large volumes of data that must be processed efficiently at the client. In the financial sector, the size of data sets can be in the hundreds of thousand records.
- **Offline-Online** – Enterprises need the offline operation of their application because business must continue even if connectivity is lost. When connectivity is restored the data gathered and modified at the client can be synchronized with the server.
- **Very high scalability** – The number of concurrent users can grow fast, especially in a B2B environment, as partners, suppliers, and buyers get added to the system.
- **SOA & Standards** – Enterprise RIA must follow the basic fundamentals of Service Oriented Architecture. Although SOA discussions mostly refer to server-side application construction, the front-end must have the same attributes. Use of standards such as SOAP, WSDL, and REST must be followed for easy server-side interoperability.
- **Migration tools from legacy applications** – To make the migration of old client-server applications, some tools should be provided to lower the labor costs.
- **Platform independence** – RIA must be able to run on any client operating system and any browser environment.

- **Rich development tools** – A rich IDE must be provided with an appropriate plug-in to standard IDE's such as Eclipse, deployed at many large enterprises.
- **Very high performance** – Enterprises have spent decades fine-tuning the performance of their applications and would not accept anything less. So latencies must be minimized for sub-second response time for many business-critical applications. High throughput and fast performance are the two critical metrics for transactional systems. The division of work between the client and the server must be carefully evaluated to minimize the round-trips. The client-side must perform much of the user interaction and caching of data.
- **Security** – Enterprises have strict security requirements for business-critical data. RIA has to address data and application protection via various technologies such as encryption and careful use of client privilege.
- **Manageability** – Applications must provide functions for performance monitoring and tuning. Dynamic configurability is also a requirement for changing needs.

## *Solutions for Enterprise RIA*

The industry offers only a few solutions to the above requirements. Ajax fails in meeting a number of the requirements, such as offline facility and high scalability<sup>2</sup>. Adobe's Flex/AIR offers good animation (due to its pedigree from Macromedia) capability, but can not handle complex 3D graphical interfaces without a lot of complex programming. In addition, the scripting language does not provide highly sufficient client performance.

Microsoft with its product Silverlight, based on WPF (Windows Presentation Framework) must also be considered. To this point Silverlight has focused almost exclusively on high performance streaming video. Microsoft has stated that they intend to make Silverlight into an enterprise platform but today it lacks many of the required features.

Curl (origin from MIT research with the same name) addresses enterprise needs effectively. Curl has a language that covers the spectrum of text, graphics, to computational logic. This "content language" comes with a JIT compiler that compiles Curl applications to the native client hardware which means very fast run time performance. Several large enterprises in Japan are current users of Curl, providing many proof points for the merits of this solution.

All of these products (Curl, AIR, Silverlight) have client-side environments that simulate a desktop environment over the web browser.

## *How to measure RIA*

While evaluating an Enterprise-scale RIA it is important to consider several metrics. These should include development time, lines of code, functionality, transaction speed, round-trip cycles, usability, and number of clicks to complete a transaction. Additionally the breadth and sophistication of the supporting libraries should be evaluated. An ideal RIA must follow the principles of SOA (Service Oriented Architecture) which advocates invocable services and assembly of such services forming an application. Most of the SOA discussion centers on server-side component assembly. An enterprise RIA should act as the front-end to the server side SOA.

<sup>2</sup> "Ajax Disappoints Power Users Looking For Web 2.0- Style Business Apps Forrester Research Report by Stefan Ried, March 20, 2008 "

## Finding Business Value

Now that Enterprise RIA based Web applications are reaching the sophistication of client-server capabilities enterprises are considering their modernization. Tim Pacileo in his recent article in eWeek<sup>3</sup> states:

*“CIOs of large organizations recognize the benefits of modernizing applications and moving away from legacy systems. But starting the process—and justifying the investment needed in an application modernization initiative—can be daunting. And too often, the potential gains of a streamlined environment are deferred in favor of a short-term focus on cost containment through maintenance of outdated, redundant and inefficient legacy applications.”*

Indeed many application modernization situations involve making a trade-off between strategic long-term investment and short-term cost containment. In these situations project managers must construct the business case for a strategic investment. Here are some sample business savings based on real Curl customer cases but using hypothetical data. While these are hypothetical cases they represent broad categories of business value and are useful in initiating and framing the discussion on business value.

- **Better Performance** - The current application takes 90 seconds to perform complex data visualization. If 1,000 employees perform this operation 50 times per day this is 1250 hours of wait time per day. If the visualization time is reduced to 1 second this saves 300,000 hours per year and at \$20/hour that is more than \$6M/year!
- **Better Visualization** - The current process to find error patterns in operational data takes 60 minutes and the department of 100 employees whose job it is to identify and fix these errors typically finds 600 errors a day. If good data visualization can reduce the time to find one error pattern to 10 minutes this would save 500 hours per day or 130,000 hours per year. At \$20 per hour this is \$2.6M in savings per year!
- **Support Cost** - The current client-server application must be updated 6 times a year to 10,000 users. Each update costs \$5 in distribution and material costs and 15 minutes of end user time. A Web application would eliminate this cost and save approximately \$600,000 a year.

While these are hypothetical examples they show the considerable savings application modernization can offer. This can be highly useful when considering an application modernization strategy<sup>4</sup>.

In the section following we consider a real customer case using the Curl Enterprise RIA platform.

<sup>3</sup> “How to Build a Business Case for Application Modernization By Tim Pacileo, eWeek, November 30, 2008”

<sup>4</sup> “The Application Management Continuum Offers CIOs A Contemporary Approach To Modernization”, Forrester Research Report by Phil Murphy, July 14th, 2008 “

## *Panasonic – Voice of the Engineer (VOE)*

Aiming to become the number one company worldwide in customer satisfaction, Panasonic is one of the world's most-recognized brand names, largely on the basis of its highly successful Panasonic AVC Networks business segment. The division manufactures and markets the majority of the company's consumer products, including plasma TVs and LCD monitors, Blu-ray and DVD players, digital cameras, video recorders, home theater systems and many other products. But while Panasonic welcomes strong sales, the reality is that the more diverse and successful its product lines become, the greater the challenge for its service department becomes.

Panasonic AVC's service division has simple objectives: discover and respond to potential quality and safety issues as early as possible in the product lifecycle. And, from the standpoint of safety, ensure absolutely safe operation of all electrical products over the long term. Sounds simple enough, but with an evolving product line that gets ever more complex, Panasonic service technicians have to continually educate themselves on new technologies and new repair techniques. But while it is critical that Panasonic technicians stay up to date with the latest technology improvements and developments, how do you make that happen for a huge global workforce that is responsible for thousands of products and product parts?

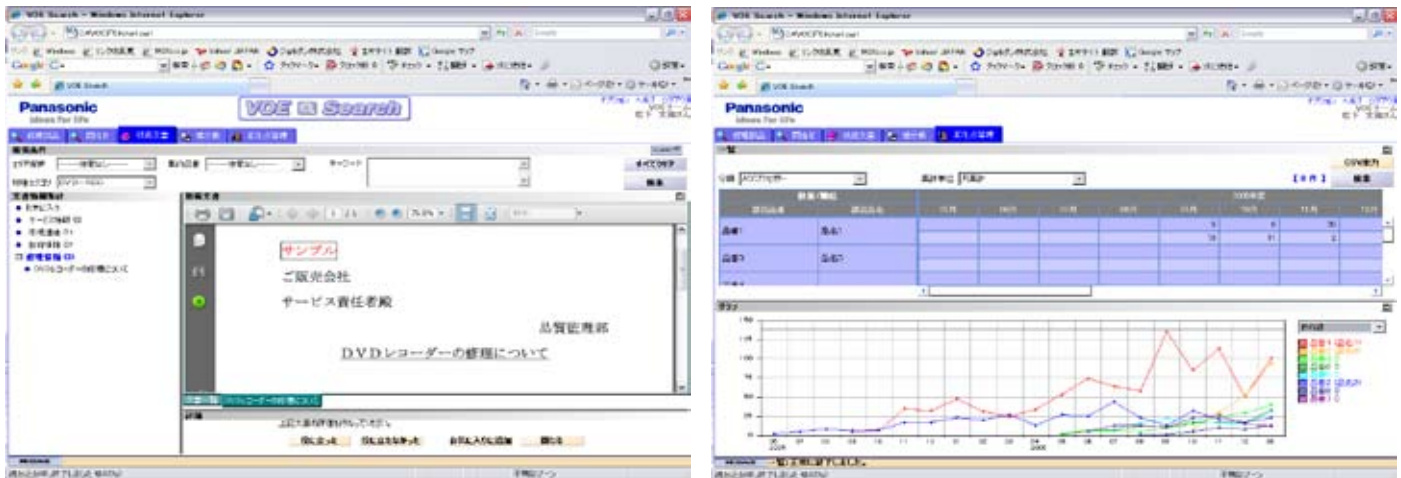


Figure 2 – Panasonic's VOE

Panasonic AVC approaches this challenge through what it calls the Voice Of Engineering (VOE). An enterprise-wide program, VOE encompasses all the initiatives and activities geared toward discovering potential critical issues in product quality by sharing and analyzing information and trends. This includes an ongoing dialog between service technicians in the field and company management to uncover potential quality issues, and nurture and advance repair and servicing capabilities in the field. The company's technological approach to its service challenges was to create an automated system—built on the Curl platform—to provide its service and support staff with up-to-date repair manuals, parts diagrams, specification sheets, and other kinds of documentation.

Originally launched in 2005, the Service Information Sharing System also allows supports technicians and engineers to:

- Use forums and comment areas to share their knowledge of new repair techniques, describe repair cases and support a higher level of customer service across the entire organization
- Through Curl, view information using a variety of methods: graphs, tables, charts with multi-layout format, etc.
- Integrate external document and data formats—Excel, PDF, etc.
- Easily operate system functions using drag-and-drop features, data filtering and graph combining

## High Performance and Data Visualization

Panasonic AVC Networks chose Curl as the development platform for its Service Information Sharing System because it provides the ideal environment for live documentation and interactive education. Initially Panasonic AVC used a database application as its service support information system.

Another advantage of the Curl-powered Service Information Sharing System is that it enabled Panasonic AVC to retain the comprehensive information storage capabilities of its existing database system, yet enhance the capabilities of that system with a powerful and flexible front end. Curl makes complicated screen controls possible, surpassing ordinary Web browser capabilities, so Panasonic developers built in the kind of advanced features and functions typically found only in client-server type applications. For instance, the Panasonic system enables users to view documents and related information in a single view. To access documents and files, users browse indexes or use keyword search. In practice, field engineers and service technicians simply type in keywords, and then narrow down their selections out of the returned list screen. This powerful search tool provides Panasonic field engineers with instant access to the vast amount of repair documentation and related information across the company. VOE Search structures information using syntactic analysis, morphologic analysis and a dictionary tool (tautology or synonym), and displays the associated information ranked against the keyword. The application draws on documents, files and associated information from several databases. The interface supports analytic tools that allow the support engineer to drag a device and drop it into a chart to render an instant analysis of part failures over time giving him an immediate view into likely problems (see figure 3). This level of performance and data visualization saves considerable time and contributes to greatly improved productivity.

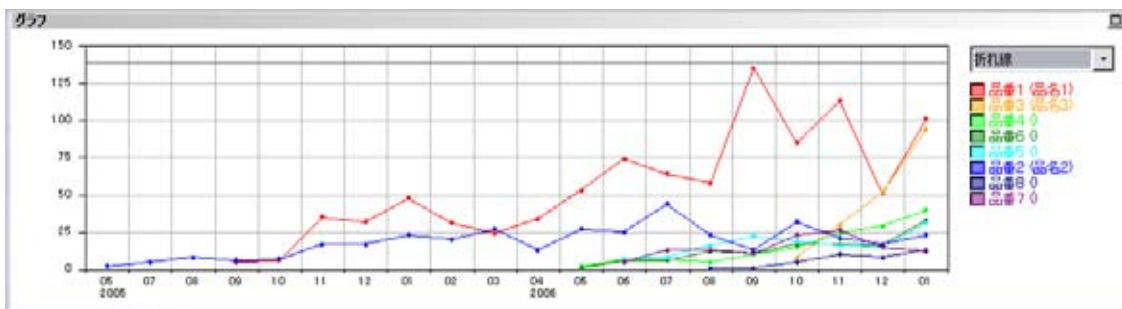


Figure 3 - Chart showing failure rates of parts for a device

Main functionality includes search for repair parts or technical documents, as well as bulletin boards to share the information and analysis views of repair processes. These discussion boards enable users to ask questions and get answers from colleagues and associates around the world. All correspondences on the bulletin board are searchable so it can be listed by the search. As engineers use the application, know-how or information are accumulated organically to speed the maintenance of information.

## *Low Support Costs - Web Delivery*

Despite delivering native client performance and visualization the VOE application is delivered over the web. Curl supports client side data store, which allows the application high performance search without costly round trips to the server. Furthermore, through web delivery application support, costs are considerably lower. With Curl's flexible file-handling properties and standard APIs for external applications, documents can be viewed right within the system interface—there's no need to open new applications such as Excel or Acrobat. In addition, Curl's elastic technology allows users to adjust the size of documents as appropriate. Operations for changing chart type, targeting parts on and off, displaying above or below a certain point, were all designed and implemented to make the interface intuitive and convenient. Further, the application provides a "Repair Trend" view, primarily used by management, which enables them to track service activity by product, product category and date (monthly, quarterly, yearly, etc.) to better understand service issues and uncover potential problems.

## *Summary*

Application modernization using RIA requires stringent requirements beyond what general RIA platforms offer. Particular attention needs to be focused on the performance, scale and security features of the chosen platform.

Application modernization offers considerable potential savings that can be realized through the use of an Enterprise RIA platform and Curl best meets the critical requirements described in this paper. Curl has over 400 customers, many listed in the Global 100 that have realized these savings.

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