

The Financial Benefits of Modeling and Code Generation for Delivering Rich Internet Applications

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Introduction

Rich Internet Applications (RIAs) are becoming more pervasive in today’s enterprises because they offer better user experiences, which lead to better financial results as measured by higher revenue at lower cost. Wikipedia defines RIAs as “web applications that have the features and functionality of traditional desktop applications, but transfer the processing necessary for the user interface to the web client and keep the bulk of the data (i.e. the state of the program, the data, etc.) back on the application server.” In order to understand the real financial (hard and soft) benefits of RIAs, however, it is important to understand the types of RIAs currently used today. This whitepaper provides examples of typical RIAs and describes how new model-centric, automated tools are used to deliver RIAs and provide enterprises with significant financial returns.

Typical RIAs

- Integration of UI with popular services (i.e. Flickr, Facebook, Google Maps)
- Integration with AJAX frameworks (i.e. GWT, Yahoo UI, ExtJS, Dojo, Mootools, JQuery, Script.aculo.us)
- Social networking applications (i.e. forums, blog)
- Business applications (i.e. order management, CRM, employee directory, benefits management)
- IT applications (i.e. LDAP admin, asset management, knowledge management, time tracker)

But why are RIAs so attractive to end users and to technologists alike?

Users know them and like them. Fifty-two percent of online consumers have used highly interactive applications – RIAs – and the overwhelming majority of those who tried RIAs say that rich applications greatly enhance their Web experience.¹

Impactful RIAs

Part	Description	Price	Status	Other
01234567	01234567	1.12	Value B	...
01234568	01234568	1.10	Value B	...
01234569	01234569	1.10	Value B	...
01234570	01234570	1.10	Value B	...
01234571	01234571	1.10	Value B	...
01234572	01234572	1.10	Value B	...
01234573	01234573	1.10	Value B	...
01234574	01234574	1.10	Value B	...
01234575	01234575	1.10	Value B	...

Source: Skyway Software, 2007

Benefits for Users

- Easily adjust sku prices in “real time”

Financial Benefits

- Delivered solution 37% faster and 36% cheaper
- \$400K incremental sales in 90 days

Technologists appreciate them because they enable tasks that HTML can't. RIAs offer companies a superior alternative to HTML for crafting customer interactions.² By providing a range of capabilities – via AJAX for improved data visualization and streamlined processes – RIAs go beyond the inherent limitations imposed by HTML, such as limited interactivity and constant page refresh requirements.

Quite simply, RIAs also deliver results. Server costs are lower.³ Users can process data directly at the client (workstation) location. Firms that measure the financial impact of their RIAs say that rich applications meet or exceed their goals more than 75% of the time.⁴

As enterprises explore new tools and techniques for delivering RIAs (that also provide measurable, impactful results), they are faced with choices. We present a summary of one of the most effective RIA delivery approaches available today – model-centric development combined with automated code generation. In this whitepaper you also will be provided with a reference case cost/benefit analysis that highlights the significant ROI available to enterprises via RIAs, especially from RIAs delivered via modeling and code generation tools.

Model-Centric Development

Model-centric development tools exist today for building, testing, and deploying robust RIAs – including layers (artifacts) that represent the UI, business logic, and data access – exclusively through modeling. The models take on a dual role of describing the software requirements and generating the working solutions to create much quicker iterations and higher quality working software. Typical model-centric development approaches yield significant benefits, such as:

- Synchronized requirements and implementation
- Faster and more frequent iterations
- Tighter integration between stakeholders
- Greater predictability
- Alignment of requirements and architecture
- Increased productivity
- Decreased waste
- Broader adoption
- Consistency in the quality of the developer artifacts
- Lower maintenance costs

With a model, the value of being able to iterate the software solution quickly throughout the process is that the prototyping stage is never lost, and can be incorporated throughout the lifecycle as an empowering force to the communication between the various stakeholders. Instead of relying on hand coding, developers who choose to use a model to represent their core programming concepts are able to write code generators, packagers, and other automation frameworks that make the work of creating (and more importantly the work of

changing) software a lot easier. For this group, modeling is a way of abstracting out the most fundamental pieces of the software solution and allows developers to deliver RIAs faster and more accurately than ever before.

Automated Code Generation

The consistent modeling syntax used in a model-centric development environment enables code generators to create the application code. Therefore, the RIA can be generated automatically, including the application logic, communications infrastructure, web servlets, and browser interfaces directly from the modeling artifacts. With automatic code generation, high quality solutions can be developed, delivered, and reproduced easily and effectively. No manual coding is required, which enables organizations to react more quickly to change, reduce overall maintenance costs, and free developers to focus on new application development that truly serves the business. So, when model-based development is combined with 100% automated code generation, developers may focus on analyzing and improving the business and in the case of RIAs, delivering solutions that achieve the objectives of the users.

Modeling + Code Generation = RIA Maximum ROI

If a business decides to undertake a new software project, they should understand how much the project will cost and analyze how much return they will receive for their investment. For enterprises that commit to modeling and automated code generation to deliver RIAs, the ROI is significant. Provided below is an example of one firm's successful ROI measured as a result of their RIA implementation using modeling and automated code generation.

An RIA Case Study⁵

Based on market research, an enterprise determined that its customers would respond favorably to RIAs for online orders. In 1 year, they estimated that the RIA could improve web conversions (web orders) by 10% by providing better information for the customer in a richer user interface. Also, by developing an RIA to easily accommodate local price changes (in response to local competition), they estimated that they would be able to match prices and receive 2% more orders, as well as improve the average order size (via higher gross margins) with certain customers. They selected a model-centric development tool with automated code generation capabilities and expected to deliver a new RIA for retail zone pricing in 30 days.

ROI Results

As shown below, the firm acquired a 10-seat license. During the training period and RIA deployment period, a RIA productivity cost was incurred based on an annual loaded cost of

\$75K per developer for a 10-member Team, who benefited from a 30% productivity increase in subsequent months. The total cost of the RIA effort was \$90K.

Cost of RIA—Tool

RIA Tool	No. of Developers	Subtotal
\$3000	10	\$30,000
Application Server Support	No. of CPUs	
\$10,000	1	\$10,000
Subtotal		\$40,000

Cost of RIA—Ramp Up

Installation	No. of Days	Subtotal
\$2,000	1	\$2,000
On Site Training/On Boarding	No. of Days	
\$2,000	14	\$28,000
Short Term Productivity Cost	No. of Months	
\$20,000	1	\$20,000
Subtotal		\$50,000

By implementing the new RIA, the firm was able to increase web order conversions to 5.5%, a 10% improvement, and they were able to increase their average order size to \$110, also a 10% improvement, which resulted in \$1.26M incremental revenue. In addition, the RIA also helped the firm reduce the cost spread for all of their orders, which resulted in \$15K of avoided costs.

Benefit of RIA—Incremental Revenue

Metric	Baseline	% Change	1 Year Benefit
Web Visits	1,200,000		1,200,000
Conversion (web order)	5%	10%	5.5%
Average order size	\$100	10%	\$110
Value of Web purchase	\$6,000,000		\$7,260,000
Incremental Revenue			\$1,260,000

Benefit of RIA—Reduced Cost of Revenue

Metric	Baseline	% Change	1 Year Benefit
Total purchase orders	200,000	2%	204,000
Cost/call center order	\$10		\$10
Cost/web order	\$1		\$1.25
Total order costs	\$1,800,000		\$1,785,000
Cost Avoidance			\$15,000

In summary, the RIA delivered significant value to the firm – the net benefit of the RIA project exceeded \$1.1M and the ROI was >1,300%.

Return on Investment

Gross Benefit of RIA	\$1,275,000
Cost of RIA	\$90,000
Net Benefit of RIA	\$1,185,000
ROI	1,317%

As technology continues to change at increasingly faster rates, the benefit of model-based development environments that are fully integrated with 100% code generation becomes more significant. This new type of software delivery capability provides an abstraction from technology, which allows enterprises to deliver innovation, such as RIAs, more effectively and more efficiently.

Conclusions

RIAs are new innovations in software delivery and they deliver real results to end users and technologists. Ultimately, firms have choices on what types of innovation (such as RIAs) to deliver to their customers and how they choose to do so. This paper provided a clear example of one style for delivering RIAs – modeling combined with automated code generation – as an effective way to create significant value for the firm and its customers.

Endnotes

1. R. Rogowski, "The Business Case for RIAs," *Forrester*, 2008.
2. *Ibid.*
3. R. Valdes, "Open Source in RIA Tools," *Gartner*, 2007.
4. J. Bughin and J. Manyika, "Building the Web 2.0 Enterprise," *McKinsey Quarterly*, 2008
5. Certain data modified to maintain client confidentiality.

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