

The Importance of ROI In Business Integration Projects

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Introduction

The Growth of “Business” Integration

Architects and developers are spending an increasing amount of time and attention to the issues of building and maintaining the integration links among heterogeneous systems. In the traditional approach, integration is performed in an ad-hoc point-to-point fashion. However, this method burdens enterprises with complex, undocumented, difficult-to-maintain and expensive application integration links. Each link is individually crafted and maintained rather than being part of a common, centrally managed integration infrastructure.

Cost implications of the ad-hoc approach are significant. Gartner estimates that about 35 percent of an enterprise’s software maintenance budget is spent on maintaining the multitude of point-to-point application links already in place.¹ However, IT organizations often do not have a good grasp of these costs, because they are usually "hidden" in the costs of maintaining the different applications. The growing need for more integrated business processes (e.g., enterprise resource planning [ERP] II, customer relationship management [CRM], supply chain management [SCM] and the zero-latency enterprise) highlights the drawbacks of the ad-hoc approach:

- Little scope for economies of scale in middleware purchases
- Hard-to-maintain custom integration code
- Difficult-to-re-use application interfaces
- Slow and inflexible business processes
- Intractable system management issues
- Lengthy deployment times for new or upgraded applications.

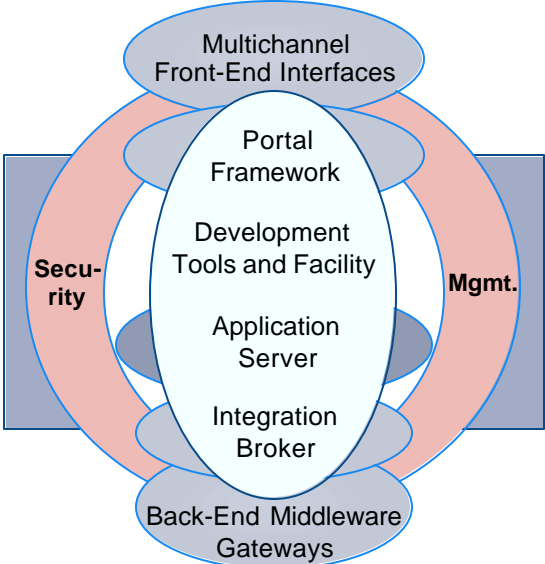
The management practices and design principles for integration have evolved significantly over the last six years. New, systematic approaches to integration differ from traditional integration in two respects. First, the responsibility for coordinating integration is delegated to a shared integration competency center (or “central integration team”) rather than dispersed within each of the application project teams. Second, there is a shared enterprise-wide integration infrastructure, generally including new forms of integration middleware. This is generally deployed in one of two ways: via a “hub-and-spoke” architecture that leverages integration object re-use, greatly increasing manageability of integration technology and reducing the level of effort required on each subsequent integration project; or via a “bus” architecture that facilitates high-speed, high-volume transfer of data between entities.

¹ “Cutting Implementation Costs By Application Integration,” 7 February 2002, Massimo Pezzini, Roy Schulte and Jess Thompson, TG-15-2830



New integration strategies are possible partly due to the emergence of standards (e.g., Simple Object Access Protocol [SOAP], extensible mark-up language [XML]), but are also attributed to the new generation of integration-related software technologies, such as message-oriented middleware (MOM), business process management (BPM) tools, extraction, transformation and loading (ETL) tools, integration broker suites and application servers. Even portal and commerce solutions are included in this environment, which takes the integration strategy out of the back office and provides an interface to deliver applications to end users (employees, customers and partners) regardless of device or location. Thus, a more descriptive term is “business integration,” especially when enterprises understand and embrace the business aspects of an integration strategy that go hand-in-hand with a central IT architecture. Figure 1 depicts the conceptual business integration architecture.

Figure 1: Conceptual Business Integration Diagram



Source: Gartner.

The Need for Return on Investment (ROI)

Shifts in the enterprise technology—fueled by budget constraints, historical over-buying and the sobering realization that business drivers do in fact trump those of IT—have repositioned ROI analysis at the center of technology-purchasing decisions. Business integration in particular has witnessed significant uptake in ROI analysis because of its high level of complexity compounded with lofty price tags for software licensing and services. Further, the integration market has entered the mainstream, where a new, more cautious buyer exists. Unlike the early adopter “Type A” enterprises, “Type B” (mainstream) companies have made it clear that they are unwilling to invest in new technology based solely on promised benefits. As the integration market matures concurrently with the technology industry, enterprises demand better, more quantifiable verification that these products will deliver measurable value.



Developing an ROI Model

The purpose of an ROI analysis is to create a framework for understanding and quantifying the potential benefits of a discrete project. The result of an ROI model is represented by the financial gain expressed as a percentage of funds invested.

The calculation for ROI is simple:

$$\text{ROI}\% = \frac{\text{Benefits} - \text{Investment(s)}}{\text{Investment(s)}}$$

The difficult part is determining the specific costs and benefits that are applicable to a specific integration project and then quantifying them.

The Difficulty of ROI

Mimicking the complexity of an integration project itself, an ROI analysis can seem ambiguous and extremely challenging. Costs and benefits will vary by type of integration (i.e., portal, integration broker, application server, etc.) and the level of functionality chosen to support the environment. For example, an integration broker that is focused only on messaging/data transfer will likely have a more straightforward ROI calculation than an integration solution that incorporates more complex functions such as transformation, routing/workflow and BPM. Similarly, a departmental portal deployed to give third-party partners a real-time view of inventory through a wireless device will have much different ROI calculations than an enterprise-wide business-to-employee (B2E) portal deployment, where the payback may be unquantifiable. Integration needs and requirements also vary significantly across vertical industries, each with different metrics for measuring value. For example, telecommunications companies may focus on tying together services, billing, and customer information systems, while manufacturing firms may require integrated logistics and inventory systems. Finally, integration can be used in many types of internal and external environments including:

- Within the enterprise: application-to-application (A2A)
- From the enterprise to partners and external constituents: business-to-business (B2B)
- From the enterprise to its employees: business-to-employee (B2E)
- From the enterprise to its consumers: business-to-consumer (B2C)
- Combinations of any of the above.

Expectations for integration solutions and the associated ROI are typically high among various constituents (business units, IT, executives, partners), although integration investments are becoming more common as enterprises implement customer resource management (CRM), supply chain management and straight-through processing systems. In order to avoid pitfalls associated with complexity, integration-specific ROI models should be built upon precise and well-defined vertical-specific scenarios rather than generic calculations.

Integration and the Relationship Between IT, Business and the Enterprise

Evolving business drivers and strategies spawn the need for a flexible and agile IT organization. It is this relationship between IT and business that makes a business integration strategy so important. The goal of today's business integration tools is to enable the IT organization to respond to the quickly changing needs of its internal and external constituents.

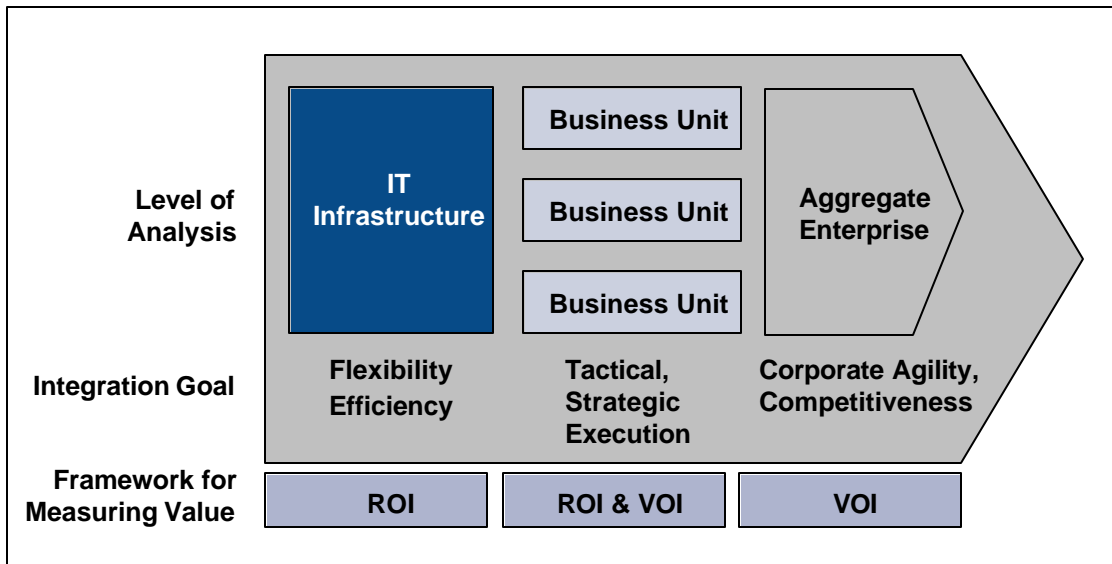
The benefits of business integration, which we will cover in more detail throughout the paper, can be seen as threefold. The goal of an integration strategy is to create:

- A. *A more flexible, efficient, and effective IT organization that is better able to use technology to respond to business needs.*** The goal of integration from an IT perspective is to increase the effectiveness of the enterprise's entire IT investment portfolio. IT organizations are driven to extract more value out of technology applications and infrastructure as well as to reduce overhead costs. These kinds of benefits are not necessarily realized during the first few integration projects—they happen over time as integration expertise is learned and integration technology is leveraged for re-use.
- B. *More agile business units that are better able to achieve their tactical and strategic goals.*** Integration technologies are rarely implemented solely to improve IT efficiency or make enterprise architecture more technically elegant. Rather, integration's primary role to increase the speed and efficiencies of the business unit and its related workflow—in short, allowing for tactical and revenue generating responses to business changes and industry trends. While it is the business drivers that explicitly impact integration technology purchasing decisions, business units typically do not understand or care about the technical aspects of integration—their focus is on executing strategies. The faster a business unit can execute its strategies (and all the associated tactical processes and workflows) the more successful it can be. That said, in today's hyper-competitive business market there are two certainties: business strategies will change and executing business strategies is inextricably tied to IT solutions.
- C. *Improved aggregate agility and competitiveness for the entire organization.*** This third benefit is an often-overlooked aspect of a business integration strategy, and is especially hard to quantify in an ROI analysis for obvious reasons. But it is clear that a more agile organization (enabled by a well-executed business integration strategy) will be more successful at generating revenues, attracting and retaining customers, and controlling costs. Enterprises must not overlook the longer-term benefits of an agile IT infrastructure, which are better evaluated in a less quantitative value on investment (VOI) model.

Figure 2 represents the high-level goals of business integration and the frameworks that can be used to measure success. Measurement becomes increasingly “fuzzy” as one moves out of the IT department, but no less important. The ROI framework should be

used to the extent possible, with added VOI inputs for the less quantifiable benefits that occur from business integration initiatives.

Figure 2: The Value of Business Integration



Source: Gartner Consulting.

Inputs to an ROI Model

Given the numerous complexities surrounding business integration, is it possible to create a business integration ROI model that makes sense? The answer is yes. ROI is possible when organizations account for both IT and business costs and benefits over a specific time period. Gartner Consulting has found that IT departments rather than the business units are the most frequent developers of technology-focused ROI models. As a result, there is often a tendency to concentrate on the elements that relate specifically to the IT budget rather than end-user costs or benefits.

It is important to view ROI from a holistic perspective in order to fully understand the impact of an integration implementation. In the sections below, Gartner Consulting has defined and provided examples of costs and benefits from an IT, business and enterprise perspective.



A. Measuring Return on Integration for IT

Goal: To create a more flexible, efficient and effective IT organization that is better able to use technology to respond to business needs.

IT Costs

Integration typically consumes 35 percent of the cost and effort of an application solution. IT costs are associated with infrastructure investments needed to support the IT environment, such as hardware, software and other capital costs required to plan and implement an integration solution. Actual licensing and services costs will vary by project, depending on the type of integration. For example, based on Gartner Consulting research, mid-size integration projects tend to have licensing costs between US\$500,000 and \$700,000, with services costs typically running four to five times the software fees. To provide a holistic view of costs, ROI analysis should also include operational costs (e.g., labor, training and fees for external services), administrative costs (e.g., maintenance and ongoing support) and communications costs (e.g., networking, telecom).

Table 1 summarizes the investments generally required for integration projects.

Table 1. Types of IT Costs

TYPES OF COSTS	EXAMPLES
Infrastructure	Licensing for client and server software; this includes both applications and middleware (i.e., portal, application server, etc.) Additional hardware required to run new software
Services	Vendor selection process, including costs for trials, time spent creating requests for proposals (RFPs), reviewing proposals, etc. Services, both break/fix and professional services from a third-party vendor Customization in general, often provided by a third party or the software vendor
IT Staff Time	Building custom adapters for those that do not exist, and tailoring off-the-shelf adapters where they do exist Designing and coding programs and program modifications Implementation time (staff time as well as management time) Building business processes/workflow into operations Building a competency center (including staffing and compensation decisions) Integrating and updating industry standards into systems Performance monitoring once system is in place, as well as during the installation process Tracking and logging problems both during and after implementation Resolving problems
Skills Development	Hiring of experts (middleware, integration, application specialists, etc.), either as contractors or as new employees Re-training of current IT staff



Indirect costs (e.g., those that do not directly affect the IT group) will also vary by the specific integration project. These costs are most often the result of process changes that affect the productivity of the business units. Nevertheless, they are integral to the project and must be carefully evaluated. These indirect business costs will be discussed in the section labeled "Measuring Return on Integration for a Business Unit."

IT Benefits

The most common IT benefits associated with integration projects are productivity and efficiency. Productivity is gained from the reusability of component objects that link disparate systems together. Efficiencies are gained because projects can be accomplished faster and with higher quality. Some IT benefits are unquantifiable, such as reducing implementation time by having better documentation, or integrating applications in real time instead of in batch at the end of the day.

While there are many types of integration, each displaying various benefits, the integration broker provides the best example of IT benefits from an ROI point of view. In point-to-point environments that do not utilize an integration broker, a new interface must be created for each application pair. In addition, the interface must be individually maintained and upgraded every time a change is made to either application.

In today's dynamic environment, this method quickly becomes expensive and unwieldy. An integration broker makes it practical to re-use adapters, message definitions, transformation rules and routing rules in some situations. This decreases the amount of time programmers spend hand coding, providing more time to work on more strategic projects with a higher added value. A traditional integration project that requires \$4 million in developer costs is likely to devote about half its efforts in building adapters. If integration middleware cuts this adapter cost by 40 percent, the project saves 0.4 x \$2 million or \$800,000 in labor. Once factoring in the cost of the integration software (typically, \$500,000), the net initial savings is \$300,000.

IT benefits will significantly vary from one platform to the next. It would be impossible to determine all the possible combinations of benefits given the diversity of industries, companies and integration types. In Table 2 Gartner Consulting has created a summary of benefits that a company should consider incorporating into an ROI analysis for integration.



Table 2. Types of IT Benefits

TYPES OF BENEFITS	EXAMPLES
<i>Increase in IT Productivity and Decreases in Costs</i>	<p>Reduces the number of developer hours and lowers support/maintenance costs due to the reusability of interfaces</p> <p>Decreases the requirements for customization as the use of standards proliferates within the enterprise</p> <p>Reduces the redundancy of middleware technologies across the enterprise because a centralized group has governance over integration projects</p>
<i>Increased Agility</i>	<p>Enables faster reaction time to changing business environments when applications or business processes can be quickly integrated (i.e., a new partner is added in the supply chain, or business rules are changed to incorporate a new ordering process)</p> <p>Creates a stronger knowledge base of enterprise-wide data from which to make better decisions</p> <p>Improves time-to-deployment of future integration projects due to increased expertise and economies of scale</p>
<i>Development of Expertise and Knowledge Transfer</i>	<p>Improves time-to-deployment of future integration projects due to increased expertise and economies of scale</p> <p>Establishes interface documentation and improved standardization</p> <p>Enables the ability to code new and existing processes quickly, so that the knowledge of these processes is not contained within specific resources that can be lost</p> <p>Enhances the visibility of IT within the company by successfully providing increased capabilities to maintain the organization's competitive position</p>
<i>Vertical/Project Specific Benefits</i>	<p>Increases adherence to government regulations (HIPAA, FDA)</p> <p>Supports employees and customers regardless of device (i.e., multichannel content distribution or transactions for various vertical market applications)</p>



B. Measuring Return on Integration for a Business Unit

Goal: *To create more agile business units that are better able to achieve their tactical and strategic goals.*

Business Costs

Business costs are typically more difficult to calculate and often underestimated. Examples of business costs include changes to business processes, downtime associated with training of business users and labor costs associated with decreased productivity as business users become knowledgeable about a specific application. In most cases, these costs are short-term investments that are included in a ramp-up period, and can be recuperated by longer-term gains in productivity and efficiency. In some cases, changes in the organizational structures and cultural norms may be required to take advantage of the integration technology. Business investment is important because if people skills are lacking or processes are broken, no amount of technology will make the business unit successful. In essence, business costs are those investments necessary to make the integration technology beneficial within the business units.

The impact of changes due to integration will vary from one business unit to another. For example, the enterprise's supply chain business unit may not face significant changes when implementing a BPM solution, due to already existing and well-documented business processes. However, if the research and development (R&D) group has historically relied on inefficient manual and inefficient processes, it may need to change both organizationally and culturally to support the new automated business processes brought forth by the integration solution.

Table 3 highlights examples of business costs that Gartner Consulting has witnessed within application integration projects:

Table 3. Types of Business Costs

TYPES OF BUSINESS COSTS	EXAMPLES
<i>People-Related Costs</i>	Informal knowledge transfer (i.e., time taken from work to show someone how to do something) Changes to the organizational culture Establishment of cross-functional teams (supply chain, marketing, finance, sales, R&D, corporate) for integration project
<i>Process-Related Costs</i>	Lost productivity costs when transitioning to new business processes Lost productivity due to downtime from ramp-up and training Opportunity costs (i.e., costs of lost revenue due to late offering to the market, or lost sales because of the inability to make changes to the old system while the new system is being implemented)
<i>Technology-Related Costs</i>	Connecting external partners (i.e., making sure partners are equipped to use integration technology, XML, or other standards)



Business Benefits

Realization of business value has historically been under-represented in ROI models, and may not always be quantitative in nature. A well-structured enterprise will measure its success through specific metrics already in place, and these existing metrics can be used to help calculate some benefits (i.e., savings from reduced headcount in the call center or for clerical staff). The measurable impact of an IT project usually depends upon the extent to which the technology implementation supports the business strategy and drivers for change. A simple way to quantify business benefits is to ask the question, "How did this technology enable my unit to conduct business faster/more efficiently?" The more general question, "How did this technology impact my organization from a tactical and strategic perspective?" can be used to help identify other benefits that are harder to quantify. To the extent possible, companies should try to quantify the business benefits when developing an ROI model, however it is also important to document the unquantifiable and intangible business benefits that exist. Gartner Consulting has found that it is important to build vertical or horizontal scenarios that align to a specific business unit and act as the "most likely" proxy.

The business benefit of moving an application into production approximately 20 percent sooner (9.6 months) instead of a year due to the use of integration technology is far more significant than the IT savings associated with the implementation. This type of time-to-market business benefit has significant revenue-generating ramifications for the organization. Our research suggests that benefits within a business unit can be grouped into several large categories as shown in Table 4. Once again, this is not a comprehensive list, but rather an example of types of integration benefits in the market.



Table 4. Types of Business Benefits

TYPES OF BENEFITS	EXAMPLES
<i>Customer Retention/Profit Growth</i>	<p>Attract new customers due to innovative integration technology with end-user touch points (i.e., transitioning from manual order entry systems to Web-based order entry that has a portal interface), which speed the process and provide better service</p> <p>Increase the total value of the customer by understanding characteristics and buying habits and successfully cross-selling new products and services</p> <p>Retain customers that would have left had the technology not been implemented</p>
<i>Customer Satisfaction and Loyalty</i>	<p>Retain customers due to high level of customer satisfaction provided through improved workflow, faster response to client inquiry and better customer knowledge</p> <p>Increase ability to customize products/services/information for customers</p> <p>Improve self-help capabilities for customers, cutting down on internal support costs and increasing response time</p>
<i>Improved Time-to-Market (Agility) Through Gained Efficiencies</i>	<p>Improve IT reaction time because IT efficiencies translate into faster launches from the business side</p> <p>Creation of a more streamlined and efficient supply chain (i.e., ability to add partners faster)</p> <p>BPM speeds the processing cycles and drives out inefficient, unessential and time-consuming processes</p> <p>Speed and automate approval process, both internal and external, through improved work flow/process management</p>
<i>Improved Business Intelligence</i>	<p>Reduce silo effect between business unit information sources, enabling a holistic view of the customer or product across the enterprise</p> <p>Better business decisions with deeper, real-time data</p>
<i>Vertical/Project Specific Benefits</i>	<p>Adherence to regulations for new government requirements (HIPAA, FDA requirements)</p> <p>Align against industry-specific business processes (i.e., within high tech manufacturing, it is essential that the supply chain is automated and streamlined in order to deliver new products quickly)</p>

C. Measuring Return on Integration for an Enterprise

Goal: To improve aggregate agility and competitiveness for the entire organization.

Enterprise-wide benefits of integration are not difficult to recognize but often extremely hard to quantify. However, benefits such as improved agility, increased competitiveness and first mover-advantage are vitally important. While there are some quantifiable business benefits that can simply be added up to obtain a representation of financial value to the corporation as a whole, the aggregate value of business integration is more than the sum of its parts. Gartner recommends that emphasis be placed on the overall VOI, which takes into account intangible value.²

Aggregate enterprise value of integration include the following:

- **Corporate image/brand:** changing the worth of a corporate brand and/or image through better processes, faster response and better data analysis
- **Competitive advantage:** ability to increase market share by responding faster than the competition
- **Strategic advantage:** ability of the enterprise to take advantage of new market conditions and customer demands
- **Intellectual capital:** increasing enterprise-wide knowledge sharing to better manage, share and promote products and services
- **Organizational advantage:** promoting an environment that eliminates corporate silos, improve employee morale, increases productivity and streamlines processes across the enterprise.

These value-added benefits are critical when presenting a financial case for integration, because they weigh heavily upon decision-makers and have the ability to impact the final decision. Over the long-term, these benefits provide the organization an opportunity to grow the business and provide better shareholder value—the ultimate goal of any investment.

² “Changing the View of ROI to VOI – Value on Investment,” 14 November 2001, Kathy Harris, Maurene Grey, Carol Rozwell, SPA-14-7250



Conclusion

ROI analysis is sometimes criticized because of the amount of time and resources it takes to develop a credible model. However, organizations that have taken the time to build good ROI models recognize the objectivity that financial analyses can provide to justify investments in large projects. This is especially valid when multiple projects are being evaluated. The ROI process provides a level playing field to compare benefits and choose those projects with the highest corporate value. Analyzing the costs and benefits of a specific project can also eliminate unplanned costs and project overruns, driving more efficient project completion.

The case studies included in this report demonstrate the value that ROI analysis provided in the project planning stages. Measuring and proving the return for these integration projects enabled each enterprise to accomplish its major integration objectives. More importantly, the returns have resulted in better business decisions, higher customer satisfaction, and business efficiencies that affect the bottom line. Staples has increased its customer base, Honeywell is making more efficient decisions, and Whirlpool has revamped its integration strategy and architecture, saving money and effort in the process.

Case Study: Whirlpool

Background

Whirlpool Corporation (Whirlpool) is the world's leading manufacturer and marketer of major home appliances, with over 60,000 employees and annual sales in excess of \$10 billion. The company manufactures its products in 13 countries and markets them in more than 170 countries under major brand names such as Whirlpool, KitchenAid, Roper, Estate, Bauknecht, Ignis, Laden, Inglis, Brastemp and Consul. Whirlpool Corporation is also the principal supplier to Sears, Roebuck and Co. of many major home appliances marketed under the Kenmore brand name.

Problem

Jim Haney, Whirlpool's chief technologist and architect whose team is responsible for evaluating new technologies, determined that over two thirds of the budget for a recent project was being spent on integration. This prompted him to initiate an evaluation of Whirlpool's business integration strategy to understand and improve the company's integration environment. The analysis revealed that Whirlpool was relying on point-to-point integration solutions, using over eight types of integration products, which resulted in a costly and inefficient integration environment. In addition, Whirlpool did not have a centralized competency center to make informed and cost-effective decisions regarding integration initiatives.

Solution

In an effort to reduce costs, improve quality and increase speed-to-market with regard to integration initiatives, Whirlpool embarked on the following initiatives:

- Instituted a governance committee to design and oversee Whirlpool's integration strategy
- Established standards around integration products and processes
- Focused on a hub-and-spoke architecture to extract time and cost savings from related integration projects
- Analyzed the ROI for its new integration strategy.

These efforts resulted in a comprehensive business integration strategy that was supported by an ROI analysis. From a purely labor standpoint, savings were realized within three quarters; when comprehensive infrastructure investments were included to accommodate architectural changes related to the new strategy, positive ROI was realized within six quarters. Whirlpool believes that the cost savings, quality of work, and labor efficiencies associated with its application integration strategy will increase over time. Whirlpool uses IBM's WebSphere Business Integration software products for application integration projects.



ROI Analysis

Whirlpool focused on the IT hard-cost savings associated with integration when developing its ROI assessment. The analysis was intentionally conservative. In addition, while business benefits were understood, they remained qualitative in nature. The two areas of focus included labor effort savings and overall cost savings.

Labor Effort

“Labor effort savings” is defined as the amount of resource hours that were reduced through employing the new integration strategy and tools. The majority of the savings result from increased reusability of business objects and connectors. Whirlpool estimated its own savings which were more conservative than those estimated by the application integration software vendor and an independent third-party services provider. Whirlpool’s scenario assumes a six- to eight-month ramp up period during which projects are subject to increased overhead and training costs. Over a 2.5-year time horizon, Whirlpool estimated that it would begin seeing labor effort savings in the third quarter of integration deployment. The table below illustrates Whirlpool’s estimates on labor effort savings using their new application integration strategy.

Table 5. Whirlpool Labor Estimates

Whirlpool Labor Estimates	2001		2002				2003				Total
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	10 Qtrs.
Proposed Application Integration Strategy (hrs)	8,648	8,835	6,278	7,756	6,931	5,874	10,464	9,834	4,186	4,186	72,990
Current Method (hrs)	8,256	8,039	10,614	13,572	13,097	12,147	14,464	12,589	7,144	7,144	107,065
Savings @ \$60/hour*	\$(23,480)	\$(47,750)	\$260,175	\$348,975	\$369,975	\$376,425	\$240,000	\$165,300	\$177,450	\$177,450	\$2,044,520

* Average fully loaded rate.

Source: Whirlpool Corporation.

Overall Savings

Overall savings included numerous metrics associated with infrastructure costs such as software licensing, hardware investments needed to support integration and high-availability (fail-over) assurance, as well as ongoing maintenance/upgrades. Whirlpool estimated that savings could be realized in the sixth quarter (approximately the mid-point of the 2.5-year time horizon). The following table illustrates Whirlpool’s overall estimated cost savings.

Table 6. Whirlpool’s Overall Estimated Cost Savings

Quarterly	2001		2002				2003			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Savings	191,610	169,170	486,565	555,159	567,879	563,739	540,511	434,870	391,862	391,448
Cost	(459,248)	(206,748)	(1,256,172)	(30,000)	(292,496)	(59,562)	(1,460,200)	(125,500)	0	(39,500)



	2001			2002				2003		
Net Benefit (Cost)	(267,638)	(37,578)	(769,607)	525,159	275,383	504,177	(919,690)	309,370	391,862	351,948
Cumulative										
Savings	191,610	360,780	847,345	1,402,504	1,970,383	2,534,122	3,074,633	3,509,502	3,901,364	4,292,812
Cost	(459,248)	(665,996)	(1,922,168)	(1,952,168)	(2,244,664)	(2,304,226)	(3,764,426)	(3,889,926)	(3,889,926)	(3,929,426)
Net Benefit (Cost)	(267,638)	(305,216)	(1,074,823)	(549,664)	(274,281)	229,896	(689,794)	(380,424)	11,438	363,386

Source: Whirlpool Corporation.

(Note: while cumulative savings were projected to be positive in Q4 2002, additional scalability investments were projected for the first half of 2003.)

Business Benefits

As stated earlier, the business benefits of the Whirlpool integration initiative were understood but kept at a qualitative level, similar to how one would measure them in a VOI framework. The business-related value creation of the business integration strategy included bring products to market faster, reacting to market changes in a more timely manner, upgrading business applications more quickly, and improving efficiencies around R&D and general business processes. These benefits in turn were thought to improve competitiveness, decrease costs, and increase sales, customer satisfaction and retention.

While the business units viewed these benefits positively, IT needed to educate the enterprise on the long-term aspect of the integration strategy. The first few projects would not be cheaper or faster due to the ramp-up time and new architecture investments. But once the hub-and-spoke infrastructure and procedures were in place and the first sets of integration objects were created, savings would be realized quickly.

“Integration is very misunderstood and what I’ve found is that very few companies get it; the ones that don’t get it but try it usually don’t see the benefits because they take the [business integration] concept and tool sets and they implement in a point-to-point fashion which defeats the purpose. You have to put in the rigor and processes to make sure folks actually use it the way it was intended—then you get the benefit.”

—Jim Haney, Whirlpool

Case Study: Staples

Background

Staples, Inc. (Staples) is an \$11 billion retailer of office supplies, business services, furniture and technology to businesses and consumers. Staples Contract, a unit of Staples North American Delivery business, provides customized office supply procurement solutions to medium- and large-sized organizations, including many of the Fortune 500. Staples Contract offers customers the advantage of customized services and pricing combined with centralized tracking and billing.

Problem

Staples Contract, through customer interaction, identified the need for a reduction in inefficiencies associated with paper/fax-based order entry and hand-written approval processes. At the time, the majority of Staples Contract orders were occurring through manual processes and workflow. For example, after a customer received handwritten approval from their supervisor, the PO would be faxed to Staples. Staples Contract discovered that its customers wished to streamline processes by leveraging new e-procurement software tools that enabled them to track spending, reduce expenses, and save on processing costs through electronic formats. Several existing customers threatened to leave Staples Contract if electronic order entry was not implemented. In addition, new customer RFPs showed that Internet-enabled order processing was a core requirement. Staples Contract believed that a web-based order processing system was unquestionably critical.

Solution

Staples Contract believed they needed to implement an integration solution that could not only enable electronic workflow on the back-end, but also provide an intuitive and easy-to-use interface for its employees and customers. Staples developed a private B2B site called StaplesLink.com for medium- to large-sized contract customers. The site transformed the inefficient, manual order-entry processes into effective, electronic workflow. StaplesLink.com provided contract customers the ability to view detailed product information, receive customer-specific pricing, place orders electronically, and include the required workflow for authorization of the purchase. The user administration feature enabled managers to establish spending thresholds within the system. If an order exceeded the threshold, an e-mail would be sent directly to the appropriate supervisor for approval. Upon approval, the order is processed and delivered to the customer the next day.

“We leveraged integration technology to meet the business and customer needs—the implementation was driven from the business point of view, however we have seen benefits on both sides, IT and business.”

—Lisa Hamblet, Staples

Staples chose IBM's Net.Commerce, the predecessor to WebSphere Commerce v5.4, to meet its front-end integration requirements. IBM Global Services was selected to help



implement the solution. Currently, Staples is undergoing an upgrade to WebSphere Commerce v5.4, which is expected to provide its customers with enhanced product functionality including real-time, dynamic pricing and inventory information as well as scalability to meet future customer needs.

ROI Analysis

“ROI is a critical component for Staples in any infrastructure investment and is a necessary step in receiving the necessary capital investment.”

—Lisa Hamblet, Staples

The Staples finance organization has developed an ROI model that is utilized prior to any infrastructure investment and again one year after funding is received to make sure that the expected return has been realized. One year after the StaplesLink.com implementation, the ROI for Net.Commerce proved sufficiently successful so that the steering committee was able to ask for and receive funding for the upgrade to WebSphere Commerce v5.4.

“We have seen tremendous growth with StaplesLink.com and will continue to make investments and complete product upgrades that will help us to adhere to our customers current and future needs—we want to position ourselves for the future in moving forward.”

—Lisa Hamblet, Staples

Costs

When creating its ROI model for its integration implementation, Staples IT costs included additional hardware, software licensing, training of IT staff through co-development with IBM, hosting services and consulting services. Consulting services costs (both internal and external) were approximately six times the licensing costs. Staples did not incorporate costs for the selection process as additional costs, because it sees due diligence as part of standard operation costs, rather than specific to the integration implementation itself.

Staples will apply the same ROI model for WebSphere Commerce v5.4, and one of its business costs will include opportunity costs while waiting for the upgrade of WebSphere Commerce v5.4. It has frozen any recoding on Net.Commerce until WebSphere has been implemented, which defers new features and functionality to the upgraded StaplesLink.com version.



Benefits

Staples Contract was successful in its strategy to win new customers, retain current customers and drive internal and external efficiencies through the integration technology. StaplesLink.com serves nearly 10,000 organizations with multiple end-users totaling approximately 2.5 million end-users. Today, 64 percent of contract orders are flowing electronically, with expectations that this percentage will increase to 70 percent by year-end. Staples Contract received greater than anticipated adoption of StaplesLink.com by its customer base. In 2001, Staples acquired 7,800 new contract customers, with 86 percent of these new customers ordering with StaplesLink.com.

Staples IT department has seen the following benefits:

- Enhanced ability to deliver information in real-time through feature/functionality of product
- Increased technical training and knowledge transfer gained through the co-development efforts
- Implementation of a scalable solution that is well-positioned for future growth
- Standardization around XML and Java (when upgraded to WebSphere v5.4).

Staples' business units have seen the following benefits:

- Reduced product returns because customers view actual images of the product through StaplesLink.com and select their exact requirements
- Increased customer satisfaction, demonstrated through the higher adoption rate than anticipated
- Higher customer retention rates that are in the high 90th percentile; many customers would have been left had StaplesLink.com not been implemented
- Gained new customers due to capabilities and user-friendly, business orientation of StaplesLink.com
- Reduced data entry errors and decreased number of keystrokes from customer care.

Lessons Learned

Staples believes that the success of its integration solution is due to the coordination and planning efforts of the Staples organization. The cross-functional steering committee enabled insights and provided a means for alignment from a business and IT perspective. Senior management was committed to the overall integration efforts associated with StaplesLink.com and the steering committee worked diligently to keep them abreast of project status. Staples advises other companies to "be prepared for success" by ensuring that the delivery organization can handle the increase in order entry, so that workflow processes stay fluid all the way through execution.

Case Study: Honeywell Aircraft Landing Systems

Background

Honeywell Aircraft Landing Systems (ALS), a division of Honeywell Aerospace, produces Bendix steel and carbon brakes for all of the world's major aircraft manufacturers. It is the sole producer of wheels and brakes for most of the U.S.'s military aircraft. ALS designs, researches, tests, produces and assembles the different types of aircraft friction materials all in one location. It also provides complete global wheel and brake repair and overhaul services through its strategically placed repair operations worldwide, with specific programs structured to meet each airline's requirements as well as FAA regulations. For instance, if an aircraft is grounded, Honeywell is required to ship parts within a specific amount of time.

Problem

ALS was having difficulty managing customer demand, leading to inefficient purchasing and manufacturing. Planning was difficult because rush orders were disrupting the ordering and manufacturing of required parts, and Honeywell ALS could not anticipate ordering trends. ALS believed part of the problem was the fact that its inventory tracking and order entry systems were unable to communicate with each other.

ALS uses MACPAC (Arthur Andersen) as its MRP system to track inventory, which is separate from its order entry system (MSA). When a customer called to place an order, ALS data entry personnel first had to go to MSA to enter the order, then into MACPAC to check on inventory, and finally back to MSA to complete the order. In order to improve customer satisfaction and streamline the supply chain, ALS wanted to implement a Web-based interface into the two systems, allowing its personnel to know in real-time whether ALS could fulfill a customer's order on time. If delays were necessary, the system would be designed to provide a new timeframe for the customer, which could be communicated immediately.

Solution

Honeywell ALS created a new Intranet application, called ATP (Available-To-Promise) that allows an ALS employee to enter an order through MSA. In real-time, ATP checks the requested parts and dates against MACPAC to ensure that the parts will be available when the customer has requested them. If the parts are available, the order is processed and no additional steps are needed. If the parts are not available on the requested date, an alternate schedule is proposed using data from MACPAC and their Product Catalog system. If the customer accepts that schedule, the order is processed for that date. If the schedule is not satisfactory, a mail message is returned to the customer stating that someone will contact them to resolve any issues. The goal of the new demand management system was to link purchasing, inventory, and manufacturing, streamline the supply chain and improve customer satisfaction.

The ATP implementation proved to be extremely successful from both a time and cost perspective. One of the critical success factors was Honeywell's already existing object-



oriented infrastructure. Since the 1960's, Honeywell has acquired many systems that historically required time-intensive and complex hand coding when changes in the business logic were required. Therefore, in 1998, ALS began implementing an object-oriented infrastructure enabling ALS to quickly integrate its different applications and create an order system for its customers that managed customer demand within its supply lead-time.

"The component (object) knows what legacy systems or commercial off-the-shelf system it has to go to in order to get the data it needs (like a part description) to do what is required, so when I'm building this client, I'm at a much higher level of abstraction; I don't need to know those details."

— Dana Cremer, Honeywell

Honeywell's existing integration platform includes IBM's WebSphere Application Server v3.53, Host on Demand, and MQ Series (although this was not used for this specific project). In addition, Honeywell ALS used VisualAge for Java, then Enterprise Java Beans, in their development efforts for ATP. These products, along with middleware components in WebSphere, allowed them to build what they needed with the infrastructure that was already in place, enabling them to save on capital expenditures and to leverage expertise learned through previous integration projects.

"We put this (ATP) together really quickly. All I had to worry about was the user interface, because the components were already built. It was almost like a plug-and-play development process because we saw much more effective reuse with this system than with anything else in the past."

—Dana Cremer, Honeywell

ROI Analysis

Financial analysis for IT-project prioritization is a long-standing business practice within Honeywell. It has an internally developed spreadsheet model that incorporates costs, interest capital, and benefits to produce a number between one and 100. The higher the number, the more important the business value is for that project (the ATP project rated a 63). Honeywell places all of the rated projects into another spreadsheet and a committee then decides which projects will be implemented.

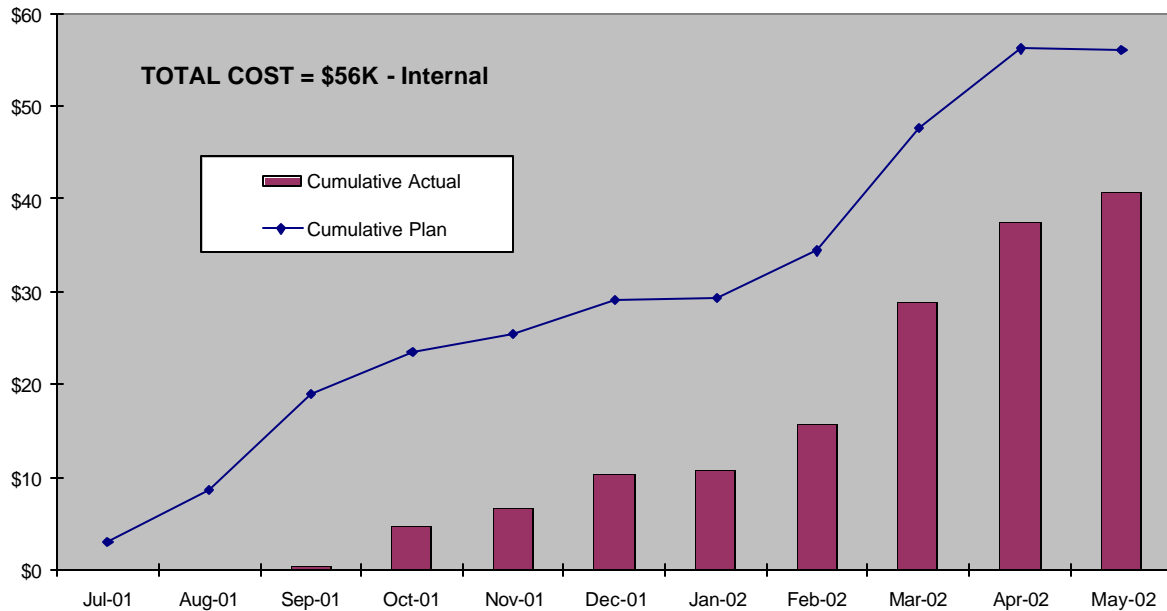
When doing the ROI analysis for the ATP integration project, ALS evaluated both benefits and costs with a five-year net present value (NPV). When analyzing benefits, however, it concentrated on quantifiable benefits, such as productivity improvements and reduction in working capital. These quantifiable benefits totaled \$182,000, while costs were only \$56,000 (the total ROI of the ATP project was 225 percent). That was enough justification for Honeywell to proceed with the project, but ALS knows that there were much higher benefits to be recognized, such as the effect on manufacturing and purchasing that they have not yet been able to quantify.



Costs

The integration infrastructure was put into place with the five previous integration projects, so the major capital purchases had already been made. Therefore, this project was able to benefit from a low cost structure, which came mostly from labor costs. Honeywell budgeted \$56,000; however, actual costs came in 25 percent lower than expected. Figure 3 shows the actual vs. the forecasted (planned) costs.

Actual vs. Forecasted (Planned) Costs



Source: Honeywell Aircraft Landing Systems

Benefits

Once the ATP application was up and running, real-time data about the order was returned to the end-user. This provided benefits down the entire supply chain. Honeywell ALS found that being able to schedule customer deliveries based on the availability of parts as well as customer schedule requirements reduced the expediting of manufacturing on the shop floor, resulting in significant manufacturing and purchasing savings. It also increased customer satisfaction because ALS was able to meet its stated delivery dates, which were based on realistic time frames and information. Employees in the internal supply chain are now able to make better business decisions based on real-time data. In addition, ALS customer service can provide order lead-time to both manufacturing and purchasing, and can communicate shipment delays to customers if demand is exceeding parts supplies.

The ATP project was completed ahead of schedule and came in under budget. For the IT group, the success of the project and the speed in which it was completed proved the concept of object reusability. It also proved, once again, that the object-oriented integration infrastructure was extremely beneficial.



Due to reusability, ALS was able to spend more time concentrating on building a user-friendly GUI for the order entry personnel. The GUI was first implemented as a rapid prototype, then IT quickly and easily made significant changes based on end-user feedback. The majority of time (over 80 percent) was actually spent in building the interface, rather than on the integration because of the Enterprise Java Beans (or components) already in place. The project just tied them together.

“This is an excellent case of where the software is ahead of the business. The business is now maturing to catch up to the capabilities offered by the software—we’re finalizing the business rules and internal processes to put into the software.”

—Lori Rozycki, Honeywell

Lessons Learned

When building its integration platform, Honeywell was highly selective about its technologies. The IT group recognizes it has been able to reach this point because of previous technology investments enabling faster implementation due to reusability. By starting implementation projects on a smaller scale, they have been able to build expertise and master integration skills. The success of the integration projects has proven that Honeywell ALS has a solid technology and software architecture in place. Therefore, demand is rising for other projects. As the IT staff is fairly small (seven architects/developers and five business system analysts), this is forcing further prioritization of projects through financial analysis and an increased emphasis on value-added benefits such as maintaining its competitive edge.