



## The Cost of Integration: TCO vs. ROI in Small- and Medium-Sized Businesses

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*The selection of application integration solutions within the SMB market space is generally driven by Total Cost of Ownership (TCO). Unlike enterprises within the 1<sup>st</sup> Tier market space, where such decisions are driven almost exclusively by Return On Investment (ROI), SMBs are more concerned with cost and speed of implementation, and the ability of the solution to scale with their business requirements.*

### Overview

The small- and medium-sized business or enterprise (SMB/SME<sup>1</sup>) market holds both opportunity and challenge for integration solution providers. On the one hand, because these enterprises are so numerous, they represent a vast potential source of revenue for the focused and service-oriented solution provider. On the other, integration spending among SMBs is generally not driven by progressive thinking and promises of return on investment. Instead, SMBs tend to spend in order to conform to the integration plans of the larger enterprises with which they conduct the majority of their business transactions. In other words, the decision is reactive rather than proactive.

As usual, the opportunities and challenges go hand in hand. Successful solution providers will not only fulfill the immediate integration needs of the client SMB, but also help them to see virtue in necessity, realize the full benefits of integration today, and plan for the integration needs of tomorrow.

There are a number of vendors currently catering to this market space. It is my intention to provide a general solution framework and examine the offerings of these vendors from the perspective of that framework. I hope that a comparative analysis of the competitors within this market space will help SMBs to discover their own needs, and to judge the relative suitability of each solution.

### Understanding the SMB Market Space

Most of the vendors compared in this document cater to the same market space. To compare these vendors effectively, we need first to develop a concise understanding of that market space's characteristics.

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<sup>1</sup> I am using the terms "business" and "enterprise" interchangeably. To be concise and consistent, I will abbreviate "SMB/SME" to "SMB" hereafter.

The SMB market differs significantly from the 1<sup>st</sup> Tier (large enterprise) and SOHO (small office, home office) markets. With low margins and the inherently lean and competitive nature of SMBs, integration project budgets tend to be low on the corporate priority list.

For SMBs, the dominant business driver in implementing an integration solution is generally the need to gain or preserve access to sales opportunities that would not otherwise be available. Visions of long-term ROI or remodeled business processes and best practices are seldom primary factors. In fact, as a general principle, SMB IT expenditure decisions are not ROI-driven at all. Instead, there is usually an element of coercion in such decisions. In many cases, such organizations conduct the majority of their business with a small number of large, multinational corporations. It is the integration needs of these large corporations that the integration solution must first meet.

As a result, solution vendors in this market space almost inevitably face negative emotions at the beginning of the sales cycle. To be successful, the vendor must be able to overcome this initial negativity and educate the client to the concrete benefits of the solution.

### Quantitative Differences

The differences between SMBs and larger enterprises are both quantitative and qualitative. The European Union cites the following quantitative criteria:

- Maximum number of employees (250)
- Maximum turnover (40 million Euros)
- Maximum balance sheet total (27 million Euros)

In order to be classified as an SMB by the European Union, a company must have fewer employees than the specified maximum, and must satisfy one or both of the other two criteria. In addition, less than 25% of the SMB can be owned by one or more enterprises that do not qualify as SMBs.<sup>2</sup>

North American descriptions tend to be more qualitative in their analysis, but, to make our discussion as inclusive as possible, let us assume that SMBs satisfy the quantitative criteria laid out in *Table 1*.

*Table 1: SMB vs. 1st Tier and SOHO organizations*

	Employees	Revenue	IT Personnel
<b>1<sup>st</sup> Tier</b>	500 plus	\$500M plus	well staffed
<b>SMB</b>	10 - 500	\$10M - \$500M	few
<b>SOHO<sup>3</sup></b>	1 - 10	\$1 - \$10M	0 - very few

<sup>2</sup> "[Definition of small and medium-sized enterprises](#)," Europa, April 2002.

<sup>3</sup> Small Office, Home Office.

## Qualitative Differences

Qualitative analyses focus on issues that define SMBs, and on their entrepreneurial nature:

[They] are characterized by their focus - what is particularly important to them - and by the style and preferences of the entrepreneurial owners...

First, *cash flow*. If you don't keep your eye on the cash -- not the financial statement, the cash (as in how much came in today and what amount went out today and this week and this month) -- then you won't be in business very long...

Second, *mission*... The company's driving force and raison d'être must remain flexible to meet the demands of the marketplace as well as to keep within the bounds of the original mission.

Finally, the nature of *entrepreneurs* is important... Entrepreneurs need to be treated a little differently.<sup>4</sup>

SMB reality is a world of low margins, tight cash, mission-critical focus, and calculated risks. Selling integration solutions in this market is entirely different from selling to large enterprises. Thomas Gullledge, professor of Public Policy and Engineering at George Mason University, cites two factors that weigh heavily on SMBs as they contemplate the supply chain integration initiatives of larger enterprises:

- The profit squeeze: shrinking profits that accompany reductions in the supply chain costs of large enterprises.
- The technology squeeze: the cost of integrating with multiple large supply chains.<sup>5</sup>

When large enterprises introduce the concept of supply chain integration, they inevitably speak of joint benefits, but, as Gullledge points out, it may not be in the interest of the large enterprise to "level the playing field" to the point where benefits are shared equally. Instead, supply chain integration initiatives frequently reinforce the advantages of the larger enterprise. SMBs naturally question the benefits of integration technology when they see profits shrinking and technology costs expanding.

The technology vendor who paints enticing pictures of auctions, reverse auctions, and real-time pricing is likely to find a skeptical audience among SMBs. The decision to adopt technology is generally tactical and reactive rather than strategic and proactive. Because they are focused on the bottom line and survival (cash flow and mission) SMBs do not seek the long-term benefits that large organizations see in supply chain integration. To them, TCO (total cost of ownership) tends to be a more relevant acronym than ROI (return on investment).

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<sup>4</sup> Marjorie M.K. Hlava, "[Expanding Partnerships for Small- and Medium-Sized Enterprises \(SMEs\)](#)," *Bulletin of the American Society for Information Science*, June/July, 1999.

<sup>5</sup> Thomas Gullledge, "[B2B eMarketplaces and small- and medium-sized enterprise](#)."

Table 2: Key Descriptors

SMB	Large Enterprise
Entrepreneurial	Corporate
Tactical	Strategic
Reactive	Proactive
Survival	Dominance
Total Cost of Ownership	Return On Investment

### SMBs and Technology Adoption

Because the focus of SMBs is very different from that of large enterprises, it stands to reason that their perspective on technology adoption will be different as well. However, there seems to have been very little consideration to date concerning the benefits that IT holds for SMBs:

There has been, surprisingly, little research into the benefits of IT/ICT for small businesses. It is generally assumed that IT 'is a good thing'. In the absence of such research it is hard to determine which IT components are vital to a business and which are merely useful. It becomes necessary to make an educated guess.<sup>6</sup>

Without hard statistics, we have to rely on anecdotal evidence from clients and the speculative analyses of academics such as Larry R. Smeltzer, professor of supply chain management at Arizona State University. Regarding eCommerce adoption, he notes some major differences between SMBs and large enterprises:

...large companies are generally more diverse and likely to be involved with mature markets. As a result, they probably have sophisticated coordination and control systems. Experience and expertise gained in creating these systems means that new supply chain technology creates less organizational stress.<sup>7</sup>

To large enterprises, supply chain integration projects are merely small parts of a larger strategy. To SMBs, with their more limited focus, integration issues appear well down the list of priorities – a disruptive innovation that threatens to shift their attention away from core competencies and mission critical activities. Smeltzer continues:

...large organizations can spread new, costly systems over larger units of production. These costly systems have less effect on each unit's profit margin...

Entrepreneurial SMBs may be risk takers, but they are not reckless. Their survival is often at stake with each IT investment decision. They will take calculated risks to achieve concrete benefits, but they won't implement a solution for vague promises of ROI and abstract notions of connectivity. Before SMBs will consider adopting an integration solution, they must be convinced that it fills a concrete business need, and that the solution is cost-effective, relatively painless, and won't distract them from their mission.

<sup>6</sup> Adrian Williams, Mohammed Farmer, "[Is ROI truly more important than TCO to a small business?](#)"

<sup>7</sup> Larry R. Smeltzer, "[The Five Immutable Laws of Universal Supply Chain Connectivity](#)," searchCIO.com.

### **SMB IT Infrastructure Constraints**

Another barrier to enterprise integration within the SMB market space is their lack of IT resources. Unlike large enterprises, which are largely self-sufficient in this respect, SMBs generally do not have the in-house expertise to develop, implement, or maintain IT infrastructure, let alone complex integration solutions. If such organizations have IT departments at all, they are usually quite limited in number of personnel, range and depth of skills, and budget. In most cases, they need external consultants to manage and deliver the integration solution.

### **SMB Management Constraints**

This lack of expertise extends beyond the ranks of their meager technical staff and into management itself. Terry Bishop, Operations Director for Blueprint Software in the UK, writes:

...the prime cause of failure in software development projects is the lack of good project management - and in this case, in my view, the blame should be laid squarely on the consultant or developer. SMEs with occasional and specific software development needs should not and can not be responsible for understanding the best way to go about managing projects of this sort.<sup>8</sup>

According to Bishop, three out of four software development projects fail to deliver the expected benefits, and only sixteen percent of such projects are completed on time and on budget. While integration is different from custom software development, and success levels are much higher, it is clear that adequate planning, complete requirements development, scope containment, and effective management of communications and expectations are required. The solution provider needs to work closely with the SMB in order to help them meet project objectives and achieve the desired results.

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<sup>8</sup> Terry Bishop, "[Software solutions for SMEs.](#)"

## SMB Integration Opportunities

Because SMBs need to focus on their core competencies, and because they do not have the expertise or resources to develop or implement their own integration solutions, they represent a great opportunity for the focused and service-oriented integration solution provider. *Table 3* summarizes these opportunities in order of prevalence.

Table 3: SMB Integration Opportunities

Opportunity Type	Description
<b>1. Exchange of documents with external trading partners (B2B)</b>	<p>This type of integration is usually accomplished through Electronic Data Interchange (EDI) and generally emulates one of the following models:</p> <p><b>'Rip-and-read'</b> – a minimal EDI integration solution is implemented to fulfill the business requirements of the external Trading Partner. Data is received electronically, but not processed any further. The solution is really not much more than a glorified fax machine. The technology would normally consist of an EDI Translator and perhaps a data-entry utility to permit editing of outbound documents. This approach is sometimes known as "swivel-chair" integration. While it seems from the outside that the enterprise has achieved full integration, what goes on behind the scenes belies this perception. Transactions arrive electronically, but are then printed and handed to a data entry clerk for entry into the internal system, making the system prone to high data-error rates and very labor intensive.</p> <p><b>Application-integrated</b> - the external data is transmitted, with little or no human intervention, into a receiving application, usually an accounting or CRM system.</p>
<b>2. Integration to facilitate internal movement of data and eliminate duplicate data entry</b>	<p>Elimination of so-called "swivel chair" integration within the enterprise. Although the ROI may seem immediate and obvious, such integration is often undertaken under duress from larger trading partners. Companies that first acquire a 'rip-and-read' EDI solution are frequently forced by an external Trading Partner, perhaps through financial incentives or penalties (charge-backs) to acquire an application integration solution or extension to the legacy EDI system.</p>
<b>3. Exchange of documents from geographically distributed company locations</b>	<p>This type of integration solution may be required when a company uses subsidiary or leased warehouse facilities strategically located throughout the country to ship goods to a Trading Partner's distribution centers. The SMB's remote facilities would be responsible for preparing some of the outbound Trading Partner documents (e.g., Advance Shipping Notice) in order to notify the Trading Partner of shipping activities.</p> <p>This type of integration happens relatively seldom, and is also generally driven by external Trading Partner requirements or as a direct result of such requirements.</p>

Opportunity Type	Description
<b>4. Integration of Web site and Web-based apps with core business apps</b>	<p>Because SMBs are adopting Internet Technologies out of business necessity, this type of integration is sharply on the rise. XML and Web Services initiatives are currently finding their way into this market space, but are being hindered by a lack of iron-clad standards and the self-defeating, proprietary approaches of some major players. As a result, Web Services integration is not as well defined as the more established EDI integration.</p> <p>Regardless of whether you use EDI or Web Services integration technologies, your primary consideration should be the availability of the appropriate off-the-shelf application adapter to permit quick and relatively inexpensive (in comparison to a custom solution) integration with the enterprise's mission critical applications – the accounting, manufacturing, shipping and/or customer relationship management systems.</p>
<b>5. Migration to a new application database</b>	<p>As SMBs grow, they often need to upgrade core business applications to better suit their size and functional needs. The migration of history and setup data to the new system, as well as synchronization issues (particularly if the systems are running in parallel during testing and cross over) require integration expertise not generally available in house.</p>

**Core Business App Integration vs. EAI – Security Perspectives**

As noted earlier, SMB integration efforts are almost never driven by ROI. On the other hand, the primary incentive for such integration efforts in 1<sup>st</sup>-tier companies is most definitely ROI.

1<sup>st</sup>-tier Enterprise Application Integration generally results from inter-departmental initiatives to reduce the resource and time requirements associated with existing methods of data processing and sharing. Such efforts often span multiple operating systems and/or local and wide area networks, forcing data to traverse local firewalls. The resulting exposure of corporate data raises security concerns, which must be addressed by the integration solution.

In contrast, core business application integration within SMBs occurs mostly inside the local firewall, and does not require the same degree of security planning as EAI does, because the firewall protects the shared data from the external world. Core business application integration security is still an important aspect of planning, but its focus is on user authentication and authorization, and data integrity, rather than on data transport security.

**General Integration Solution Framework**

Having described the market space, defined its inherent constraints, and enumerated the integration opportunities within it, we can now proceed to examine a general framework for SMB integration solutions.

Given the limited nature of SMB IT departments, an integration solution must be easy to install, maintain, and use. Because ease of use is so important, many integration solutions may have

reduced feature sets in comparison to larger enterprise solutions. Typical EDI and/or B2B integration is accomplished through an exchange of a limited number of business document types. The set of documents exchanged depends on specific B2B Trading Partner requirements, but would most often be limited to the following:

- Purchase Order
- Invoice
- Proof of payment
- Inventory info
- Inventory availability
- Customer info
- Customer inventory pricing
- Vendor info
- Delivery notice (Advance Shipping Notice)
- Stock transfers and adjustments

### Criteria for Comparison of Integration Solutions

In order to provide the most objective comparative analysis possible, we need to establish the criteria that have relevance for the SMBs themselves, and it is the user/customer that will be the ultimate judge of their validity. The issues are more numerous than the products, but we will restrict the analysis to those issues that hold objective relevance within the SMB market space.

Because the majority of integration solutions aimed at the SMB market space are designed to run in Windows NT or Windows 2000 environments, we will ignore operating systems and related issues in our comparative analysis. Although our primary concern is with the SMB market space, we include vendors who cater to the 1st Tier and SOHO market spaces for the sake of comparison.

Table 4 presents a matrix of the criteria we will use to compare SMB integration solutions.

Table 4: Criteria for Comparative Analysis

Universality	
<b>Market space</b>	Does the vendor cater to 1 <sup>st</sup> Tier, SMB, and/or SOHO spaces? The core applications used in these different spaces vary considerably: <ul style="list-style-type: none"> <li>• <b>1st Tier:</b> SAP, JD Edwards, BAAN, PeopleSoft</li> <li>• <b>SMB:</b> ACCPAC Advantage, GP Dynamics, MAS 90</li> <li>• <b>SOHO:</b> Simply Accounting, Quicken, QuickBooks</li> </ul>
<b>Application Adapters</b>	How many application adapters does the vendor support, and of what type are the adapters (e.g., ERP, CRM)? The more adapters supported by the vendor, the less customization likely to be required for individual solutions.
<b>Multiple Application Document Universality (Common Document Schema)</b>	Does the solution support import and export of multiple documents with common document schemas independent of the application being integrated?



## EDI Friendliness

<b>Import / Export Document Templates</b>	Does the vendor have a library of definition, map template, and schema files for a large number of Trading Partners? The size of this library has a direct impact on the universality of the solution, the speed with which each Trading Partner can be integrated, and the Total Cost of Ownership (TCO).
<b>EDI Translator compatibility</b>	Is the solution compatible with one or more EDI Translators? If built-in, does the solution provide full translator functionality, or a limited subset? Limited functionality here can affect the scalability of the solution.
<b>Advance Shipping Notice module</b>	Is there an ASN module available, and is it integrated with the solution?

## Scalability / Adaptability

<b>Soft-coded Document Transformation (Mapper) utility support</b>	How easily can map template, definition, and schema files be adapted? Does the solution provide the means to allow the user organization to perform such adaptations easily, or are templates hard-coded?
<b>Data formats supported</b>	What data formats does the solution handle natively? Common formats include EDI (X-12, UN/EDIFACT), XML (SOAP, OAGIS, Rosetta/Net), Flat (fixed length, delimited), and CSV.
<b>SDK availability</b>	Does the vendor have a Software Development Kit to permit third-party integration of their core technology?
<b>Average Cost of Integration, 1<sup>st</sup> Trading Partner</b>	On average, how much does it cost to get up and running with the first Trading Partner? The cost and timeliness of implementing additional Trading Partners will be dependent on the universality of the solution (i.e., how much customization is required, and whether there is a library of map templates on which to draw).

## Vendors, Products, Solutions Evaluated

The following vendors provide integration solutions to the SMB market space:

Table 5: Vendors Evaluated

Vendor	Product / Service	Web Site <sup>9</sup>
Trinary Systems	EDI Windows™	<a href="http://www.trinary.com">www.trinary.com</a>
Vsync (Enhanced Software)	EDI for Great Plains	<a href="http://www.vsync.com">www.vsync.com</a>
Scribe Software	"Demand Chain Management"	<a href="http://www.scribesoft.com">www.scribesoft.com</a>
Data Junction	Integration Studio Integration Engine Content Extractor	<a href="http://www.datajunction.com">www.datajunction.com</a>
Proven Solutions	"EDI Implementation Services"	<a href="http://www.proven-solutions.com">www.proven-solutions.com</a>
1 EDI Source	EDI Complete	<a href="http://www.1edisource.com">www.1edisource.com</a>
Data Masons	Vantage Point EDI	<a href="http://www.datamasons.com">www.datamasons.com</a>
Edisoft Ltd.	Edisoft Merchant	<a href="http://www.edisoft.com">www.edisoft.com</a>
EDI Specialists, LLC	"consulting/assessments, contract mapping, application integration, education and training, outsourcing, HIPAA compliance"	<a href="http://www.edispecialists.com">www.edispecialists.com</a>
eBRIDGE Software	eBridge	<a href="http://www.ebridgesoft.com">www.ebridgesoft.com</a>

<sup>9</sup> I have included links to the vendors' Web sites so that you can examine their individual claims for their products and services. In presenting these links, I make no representation concerning the accuracy of any such claims.

## Universality

The first three categories of comparison indicate how broadly applicable the vendors' solutions are.

Table 6: Universality of Solutions

Company/Feature	Market Space	Application Adapters (number & type)	Multi App Document Universality (Common Doc Schema)
<b>Trinary Systems</b>	1st Tier, SMB	5 ERP <sup>10</sup>	No
<b>Vsync (Enhanced Software)</b>	SMB	1 ERP (GPS)	N/A
<b>Scribe</b>	1st Tier, SMB	12 CRM & ERP	Yes
<b>Data Junction</b>	1st Tier	custom development required	N/A
<b>Proven Solutions</b>	SMB	1 ERP (V Account Mate)	N/A
<b>1 EDI Source</b>	SMB, SOHO	custom development required	N/A
<b>Data Masons</b>	SMB	5 ERP	No
<b>EDISoft</b>	SMB, SOHO	2 ERP	No
<b>EDI Specialists LLC</b>	1st Tier, SMB	custom development required	N/A
<b>eBRIDGE Software</b>	SMB, SOHO	25 ERP & CRM	Yes

<sup>10</sup> "Enterprise Resource Planning" generally refers to high-end accounting and management suites, but here, for the sake of convenience, we also include mid-range accounting packages under the acronym "ERP."

## EDI Friendliness

Use these categories to judge solutions' degree of friendliness and adaptability to established EDI practices and tools.

Table 7: EDI Friendliness of Solutions

Company/Feature	Import Export Doc Templates (Import, Export, Multidoc)	EDI Translator Compatibility	ASN Module
Trinary Systems	Inbound, Outbound	Built-In	Yes/Integrated
Vsync (Enhanced Software)	Inbound, Outbound	Bundled	Yes/Non-Integrated
Scribe	No	No	No
Data Junction	No	Built-In	No
Proven Solutions	Inbound, Outbound	Built-In Semi Translator	Yes-Custom coded
1 EDI Source	No	Built-In Semi Translator	Yes/Non-integrated
Data Masons	Inbound, Outbound	Built-In	Yes/Integrated
EDISoft	Inbound, Outbound	Built-In Semi Translator	Yes/Integrated
EDI Specialists LLC	No	Outsourced	Yes-Custom coded
eBRIDGE Software	Inbound, Outbound	Bundled	Yes/Integrated

## Scalability / Adaptability

Use these categories to judge whether the solution can grow with the company implementing it.

Table 8: Scalability/Adaptability of Solutions

Company/Feature	Soft Coded Doc Transformation (Mapper) utility Support	Data Formats Supported	SDK Availability	Average Cost of Integration of the 1st Trading Partner
<b>Trinary Systems</b>	Yes	X-12, EDIFACT, XML	No	30K
<b>Vsync (Enhanced Software)</b>	Outside Solution (Gentran Integrator)	X-12, EDIFACT, XML	No	10K
<b>Scribe</b>	Yes	XML, TEXT	No	30K
<b>Data Junction</b>	Yes	X-12, EDIFACT, XML & OTHERS	Yes	100K
<b>Proven Solutions</b>	No (hard-coded templates)	X-12	No	10K
<b>1 EDI Source</b>	No (hard-coded templates)	X-12, EDIFACT	No	N/A since custom programming required
<b>Data Masons</b>	No (hard-coded templates)	X-12	No	10K
<b>EDISoft</b>	No (hard-coded templates)	X-12, EDIFACT	No	8K
<b>EDI Specialists LLC</b>	Outside Solution (any commercial mapper)	Custom development required	No	20K
<b>eBRIDGE Software</b>	Yes	X-12, EDIFACT, XML	Yes	10K