



# **XMLSolutions Corporation**

## **Product Development Strategy**

Version 5.3 • 30 January 2001 • Jeffrey Ricker

# Executive Summary

## Business requirement

XMLSolutions is defining the direct materials electronic procurement market for the Global 2000. The chief procurement officer of these companies is automating his supply chain, to make it more agile, so that his company can gain more market share by rapidly responding to customer expectations. For example, General Motors wants to automate its supply chain so it can delivery to its customers an automobile manufactured to their specifications in N-weeks.

We will define and own this market by (1) owning the part of e-procurement the customer knows and understands best, which is the console, and (2) having a core technology that is hard to replicate, which is XML transformation.

To meet expectations of the Global 2000, we must prove ourselves as production-reliable software that enables the customer along a migration path. To lower the barriers of sales, we will provide value-added industry specific data dictionaries, transformations and process flows. Finally, we will not shy away from opportunities to OEM our core technology to strategic companies such as Cisco and Sun Microsystems.

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# Introduction

## Background

In the movie *Vertigo*, Alfred Hitchcock used a film technique of pulling the camera rapidly upwards while at the same time zooming the camera's focus tighter inwards. The result was a startling and dizzying effect for the audience from which the movie took its name. XMLSolutions has undergone a similar process of drawing out and focusing. Over the past three to six months, our focus on the customer and the customer's need has grown tighter, while at the same time our scope of what capabilities we are addressing has grown wider. The result in the company seems to have had the same effect in filmmaking — vertigo.

Since its inception in April 1998, XMLSolutions has published and maintained a strategic corporate business plan. This product strategy document was last published as version 4.2 in February 2000. The partnering section was first published in October 1999. I am shocked, in a positive way, at how little our strategic focus has wavered. I am even more shocked, and in a negative, at how inadequately we have communicated this strategy throughout the company. Let's change that going forward with a broader release of this document.

## Fundamental strategy

Our fundamental strategy as a company has not changed since the company was reorganized in June 1999.

## Technology situation

Extensible markup language (XML) technology holds the promise of rapid strategic advantage in e-commerce. The objective of e-commerce is to eliminate manual processes by allowing the internal applications of different companies to exchange information directly. Thus, electronic commerce is at its heart a trans-enterprise application integration challenge.

XML is the breakthrough simple solution to universal serialization. Serialization is the process of transforming complex information structures such as objects or relational databases into a string of text characters. Serialization is necessary when any two applications need to share information. Business to business e-commerce is based on different applications sharing information directly. Thus, XML is the key to e-commerce.

## Business situation

Forrester Research has projected the e-commerce software market to be \$300 billion in 2002. As such, Global 2000 companies have initiated XML projects and prototypes in 1999 and have rapidly expanded those projects in 2000.

The Global 2000 companies are in decision mode to choose their e-commerce vendor partner. They are looking for a complete solution. They are not inclined to form their own collection of vendors, even if they have already identified for themselves a logical combination.

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**Note**

Lockheed is a case in point. They had identified Netscape, GEIS and XMLSolutions as their e-commerce vendors, but requested that the three companies come together with a single proposal rather than Lockheed simply contracting with each vendor independently.

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### **Corporate mission**

Build a large, profitable e-commerce software solutions company that fulfills the needs of the Global 2000

### **Concept of operation**

XMLSolutions will build a large, profitable e-commerce software solutions company through the combination of *six core strategic advantages*:

1. Rapidly developed software,
2. Superior integration services,
3. Open standards for e-commerce,
4. Expertise in legacy metadata,
5. Co-branded data services and
6. Built-in ability to grow and attract talent

In addition to our own strategic advantages, we will leverage the strength of others through tight, formal alliances.

Munro's Law states that, "The value of an electronic commerce solution is exponentially proportional to the number of companies that use it." We employ this law to our advantage rather than our detriment through our *fundamental strategy*:

- Own the Global 2000 accounts
- Partner to reach the midsize companies
- Give away to reach the small companies

This mission and concept of operation has transcended the execution of our strategy. The evolution of our strategy has been a continued process of learning how to best fulfill our mission and concept of operation.

## **Evolving execution**

XMLSolutions' execution of its strategy has evolved over time. It has undergone the vertigo effect that I described in the introduction.

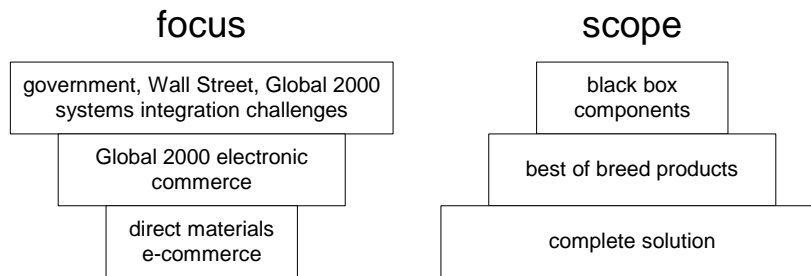
At first, our strategy was to build black boxes that comprised unique functionality that made XML-based electronic commerce possible. These boxes included XML workflow and server-side stylesheets. These boxes would make up 80% of the necessary functionality, with 20% made up with professional services. The logic there was that no matter what you sell to the Global 2000, they are going to want to customize it anyway. This message was too hard for a fledgling company to communicate, so we changed our strategy by focusing and drawing back.

The second strategy was to build best of breed products that were vitally important to the success of electronic commerce as a whole. We would choose which products to build based on the internal capabilities of the company. Our development team included parser experts and our services team included metadata experts. The resulting products were the XEDI Translator and Schema Central. Our intent was to

partner with larger electronic commerce companies that we complemented, such as GEIS, Sterling, CommerceONE, WebMethods, etc.

Our second strategy was inadequate for two reasons. First, the customer wanted a complete solution from one company. They didn't care whom the company partnered with so long as they only had to deal with one company, make one phone call, and write one check. Second, the companies we wanted to partner with saw us as a threat. These companies were broad and thin in their technical capabilities while we were deep and narrow. For the capabilities we brought, the others either already had a poorer solution or they had nothing but had told the customer they did. Either way, we were an embarrassment for them.

Thus, we focused tighter on the business problem and drew further back in our scope.



**Figure 1 The vertigo effect of our strategic evolution**

Our current strategy is to provide a complete solution for direct materials procurement to the Global 2000 chief procurement officer by combining our best of breed products with strategic partners under a single unifying console that we build. We will maintain control over this alliance by (a) owning the customer relationship, (b) providing what the customer relates to and understands (which is the console) and (c) providing some of the hardest parts of the solution to replicate (which are XEDI and Translator/Mapper).

This strategy has risk in that we are dependent on other companies. It is a calculated risk, and capitalism rewards calculated risk. In return, we are both deep and wide in capability whereas our competitors such as WebMethods are only wide. We should be strong in combination at any point of decision.

### **Like water flowing down hill**

The First World War was distinguished by its trench warfare. Never had armies met so large that they extended across the entire frontier of German and France. To meet this new challenge, the French invented Synchronized Battle, a technique of coordinating thousands of units to move online together. The US Army is in many ways still operating under this concept of battle. The key is to keep all parts moving forward together, never exposing a flank.

The Germans invented another technique called *Strosstruppen* or Stormtrooper. Instead of striving to keep on line, the storm troopers moved like water flowing down a hill. When water finds a hard point, it flows around it. The follow on torrent later subsumes it. The stormtroopers moved around French strong points and poured through their weak points, leaving the strong points surrounded from behind. If not for the last minute arrival of the US Army reinforcements on the Marnes, this technique would have won the Germans the war.

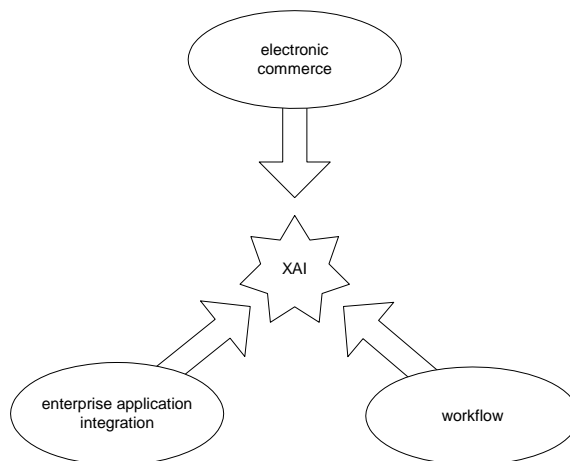
We as a company are following a kind of stormtrooper technique in our attack on the market. Instead of building all of the pieces necessary for e-commerce, we are partnering for the parts we don't have and moving rapidly forward. Our competitors such as WebMethods, on the other hand, are concentrated on synchronizing all the parts of their solution and moving forward as a single line.

Some will say we have exposed ourselves to risk by making ourselves dependent on our partners. A good cavalry officer will tell you, if the enemy is on your flank, then you are on his. Our partners are just as dependent on us, and if we control the attention of the customer, then they are more dependent on us.

As the torrent that follows the flow subsumes the obstacles, and the German infantry subsumed the French strong points, so likewise our company as it grows exponentially larger can subsume many of the strategic technologies it has by passed through partnerships.

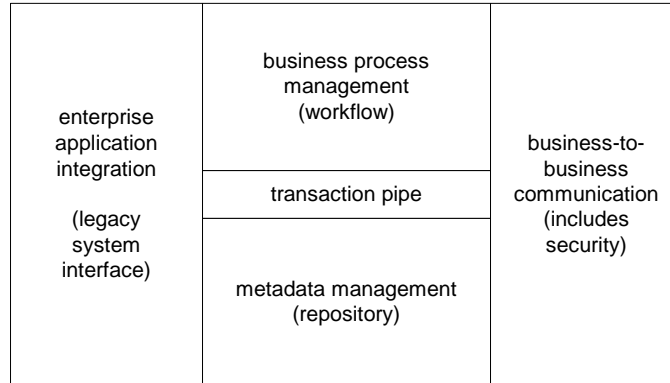
## Technology big picture

Up until now, enterprise application integration (EAI), workflow and electronic commerce were considered three distinctly different markets. Markets are defined by product requirements. It is safe to say that these were three distinctly different requirements in the eyes of the CIO. Business-to-business electronic commerce has changed this expectation of three market needs into one.



**Figure 2 Three industries collide**

The objective of e-commerce is to have the internal applications that run your business communicate directly to the applications that run your trading partners' companies without needing human intermediaries. Access to the applications that run your business is an enterprise application integration (EAI) challenge. Exchanging electronic documents securely with your trading partners is an e-commerce Internet challenge. Allowing the interface to pass straight through from your trading partners to your internal systems is a business process management or workflow challenge. It is also a metadata challenge, because your trading partners will speak different languages than your internal systems do.



**Figure 3 The big picture: four industries converge**

The Global 2000 expect a complete solution. However, as of yet, no single company provides a complete solution. The customers that can specify a combination of companies that form a complete solution seem unwilling to deal with each company individually. The technology is so new, however, that most companies do not know how to assemble a complete solution. Nor have the systems integrators displayed a full grasp of how to integrate the key pieces.

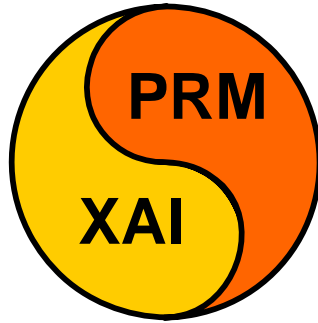
## High level roadmap

XMLSolutions has consistently released product every 90 days or less. These rapid releases have marched as forward with ever expanding technical capability focused on an ever-tighter business purpose.

| Date       | Release                                  |
|------------|--|
| 1999.08.01 | Exeter XML Server 1.0                    |
| 1999.09.22 | XML Zip 1.0                              |
| 2000.02.14 | XEDI Translator 1.0                      |
| 2000.04.15 | Schema Central 1.0                       |
| 2000.06.15 | XEDI Translator 1.1                      |
| 2000.09.01 | Business Integration Platform 2.0        |
| 2000.11.15 | Business Integration Platform 2.1        |
| 2000.12.28 | <i>Business Integration Platform 2.2</i> |
| 2001.04.15 | <i>Business Integration Platform 3.0</i> |
| 2001.06.15 | <i>Business Integration Platform 3.1</i> |
| 2001.09.15 | <i>Business Integration Platform 4.0</i> |
| 2001.12.15 | <i>Business Integration Platform 4.1</i> |

**Table 1 XMLSolutions product release record and schedule**

Business integration has two parts or faces: the business focus of partner relationship management (PRM) and the programming focus of trans-enterprise application integration (XAI).

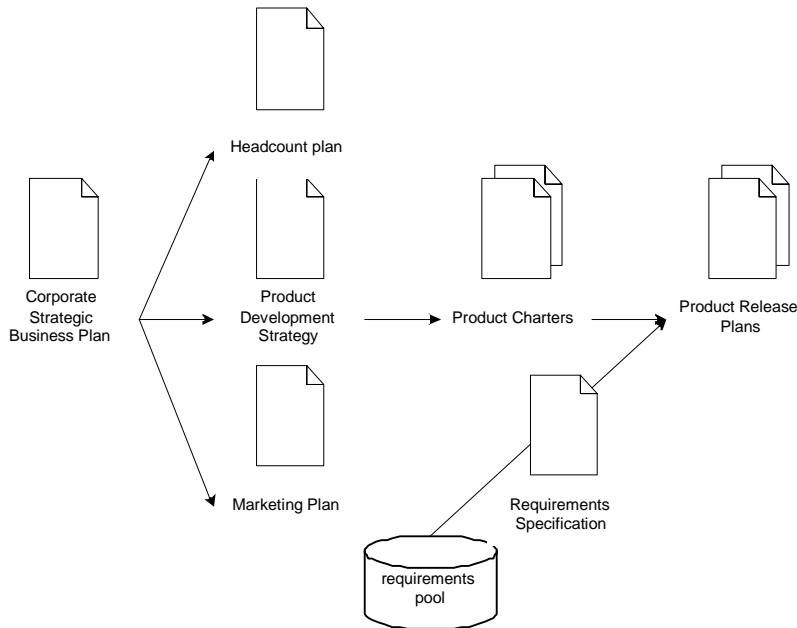


**Figure 4** The two faces or parts of business integration

### Purpose and scope of this document

Our company continues to grow and mature. A company of 150 to 200 employees behaves dramatically different than a company of 30 or 50. In particular, a small company can meet face-to-face and operate in terms of individuals and their strengths and weaknesses. A company of 200, on the other hand, must operate through documents and plans based on roles and responsibilities. This Product Development Strategy is intended to fulfill such a purpose.

Figure 5 shows this document’s place within the strategic planning process. The Corporate Strategic Business Plan feeds directly into this Product Development Strategy. Other documents also spawn from the Business Plan such as the Headcount Plan and the Marketing Plan. The Product Development Strategy feeds into Product Charters, which then feeds into Product Release Plans. A Requirements Specification document also feeds into Product Release Plans, and is linked to a requirements pool.



**Figure 5** Strategic Process

# The customers' expectations

*We do not build technology for technology's sake. We build software to fulfill a customer's business requirements.*

## Who is the customer?

We have 2000 customers and potential customers; they are the chief procurement officers of the Global 2000.

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Change from 4.2

In the previous versions, we stated that the customer was the chief information officer (CIO) of a Global 2000 company. This is a significant strategic change that is not fully reflected yet in our strategic thinking.

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We say "Global 2000" rather than "Fortune 500" for two reasons: we are an international company and the phrase "Fortune 500" is trade marked. Otherwise, the terms are synonymous. The phrase essentially means very large companies. Some customers such as Cargill are not on the Fortune 500 list because they are not public traded. Nevertheless, we will use Global 2000 even though we mean Global 2000-ish.

Note who the customer is not. The customer is not the developer. We do not pander to the geeks. We communicate to the technical staff to the degree that the advise the procurement officer on his or her decision. The customer is not the small or midsize company. We do not compromise our solution or our pricing model to reach them. We communicate and enable the midsize and small companies only to the degree that it increases the utility of our products for the Global 2000 company.

Most of our competitors have either consciously or unconsciously designed their products and their companies for the midsize market. Object Design and OnDisplay are good examples. Others have either consciously or unconsciously designed their products and their companies for the developer rather than the decision maker. Sequoia and Bluestone seem to be good examples of this decision.

If we look at Object Design and Bluestone, we see a definite inability to meet the expectations of the Global 2000. By making these decisions now on who our customer is, we will build capability that simultaneous enables us to reach the Global 2000 market and precludes us from reaching the midsize company developer market. Other companies, even if unconsciously, make decisions that produce the exact opposite condition for themselves.

We do have auxiliary customers, such as developers and business partners, but they take second place to our primary customer.

## The customers' world

The following summarizes our current understanding of the customer.

### Legacy systems run the company

The single most distinguishing fact facing an Internet technology company selling to the Global 2000 is the continued primacy of the mainframe. Most Internet companies refuse to accept this fact.

## Mergers and acquisitions

Mergers and acquisitions are a matter of existence for Global 2000 companies. The fundamental goal of M&A is to gain efficiencies or economies of scale, plain and simple. In the 1990s and most certainly in this decade, these economies and efficiencies hinge entirely upon the consolidation of information infrastructure.

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### Important!

Global 2000 companies are actually companies of companies. This means that the e-commerce solution for a Global 2000 company is exactly like the solution for a clearinghouse or hub. That is, it is a many-to-many exchange between internal divisions and external trading partners.

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## Competing divisions

As a result of the years of M&A, Global 2000 companies have within them divisions that use to be competing independent companies with decades of history and corporate culture. Like Alsace-Lorraine, the vestiges of their past can never be completely removed. They are never completely assimilated. There continues open hostility between divisions.

Another form of competition arises from *services* divisions. Many large companies create divisions within their company that do not deal with outside customers, but rather exist to serve the divisions within the company. (It is my belief that mere existence of such a division is a clear signal for outsourcing!) Boeing, Lockheed and Fidelity are all prime examples. The performance of these internal service divisions is invariably found wanting by one or of the “front line” divisions of the company. For instance, in Boeing there is a constant friction being the Commercial Aircraft division and the Shared Services division. Commercial Aircraft has the clout to be able to refuse Shared Services dictates, but the other divisions such as Military and Helicopter are not so lucky. As a result, companies like Boeing can have two or more competing “company-wide” e-commerce initiatives.

## Risk averse

Global 2000 companies are inherently more risk averse than small companies. The consequences of a production system failing are much more visible, severe, and harder to rectify than they are with a small or midsize firm.

## Evolution, not revolution

By their very size, large companies cannot revolutionize. They cannot simply change over night. They must evolve. This fact, combined with risk aversion, compels Global 2000 companies to look for migration plans for new technology. Most Internet technologies are designed in a vacuum. They assume that the technology is employed where nothing else exists. For instance, they build a database and populate it with the data they need, such as trading partner profiles. In a large corporation, a substantial infrastructure already exists. A preponderance of the data necessary already exists in other systems. The Global 2000 company is looking to extend his investment and replace it over time.

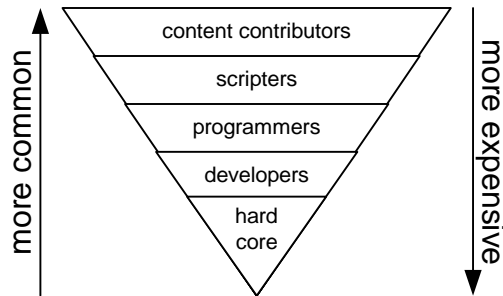
## EDI

Every Global 2000 company has some installation of EDI, however unsuccessful. Most of them seem to hate it and look forward to the day they can unplug it. All the companies we have spoken to welcome our approach to leveraging the existing EDI

investment to bring XML-based e-commerce up very quickly. However, the all are very adamant that they want to eventually remove their EDI systems and move directly from their internal systems to XML.

## Scripters

There is a dearth of information technology talent. The typical skill level within a Global 2000 IT shop is usually scripters with some programmers. What few developers that are available are trained in legacy technology such as COBOL or RPG.



**Figure 6 Make-up of the IT talent pool**

Scripters can deal with ASP, Visual Basic, JavaScript, XSLT, and perhaps Java Beans. We must make our products usable at the scripter level in order to gain critical depth within the Global 2000 companies.

By coincidence, midsize companies also have scripters, but they are not the reason we adopt this approach.

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### Disconnect!

Most of the effort in selling a new technology involves educating the customer. The inverted pyramid is a very compelling argument to most CIOs I have come in contact with. It places the adoption of XML technology in general in a strategic context. I do not see this appearing in our sales or marketing message.

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## Training and support

The highest quality training and support wins the love and affection of the Global 2000 IT staff.

## Not consultants

You can hear them say it almost like Phil Hartman's Frankenstein, "Consultants BAD!" Although they want training and support, they are very leery of being placed on consultant life support. The customer responds very well to the concept that we have consultants in order to teach the customer to be good consumers of XML software, not dependent consumers of consulting man-hours.

## Focus on what they understand

Customers focus on what they understand, and they understand the graphical user interface.

## Complete solution

Customers want a complete solution. They want to deal with one company, make one phone call when things go bad and write one check. Even when they themselves have

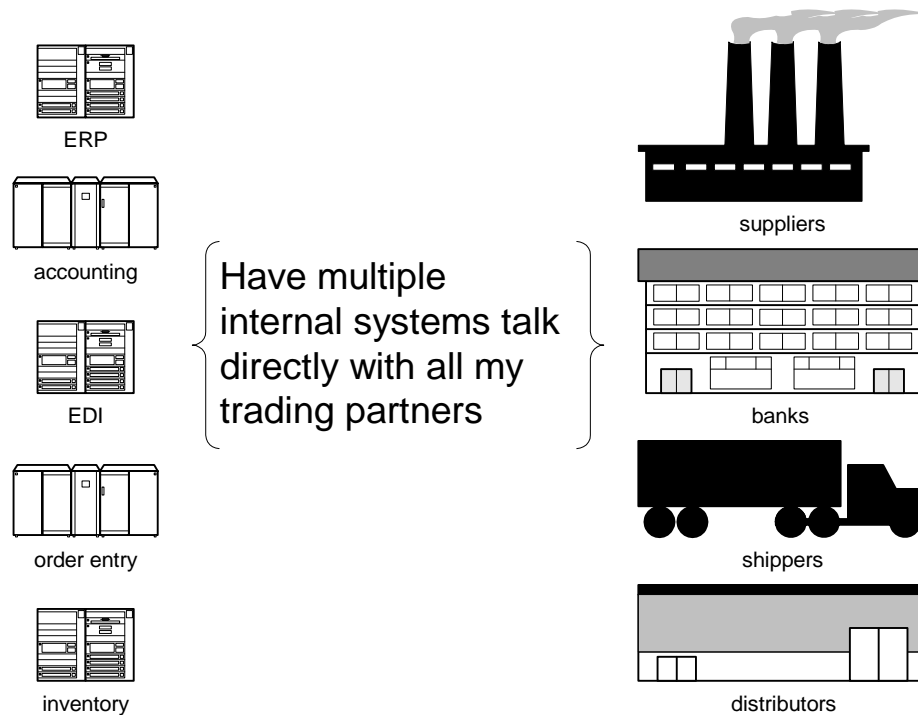
identified the mix of companies they know make the solution, they ask that one company take the lead and the others subcontract to it. This is exactly what Lockheed Martin did.

**Cost sensitive**

Global 2000 companies, even though they are large, are cost sensitive. There are psychological cost barriers that they are hesitant to cross. We all have them. We are as consumers more reluctant to go from \$95 to \$105 than we are from \$85 to \$95, even though \$10 is a greater percentage of \$85, because \$100 is a psychological threshold. The same holds true for corporate procurement officers with many more zeros to deal with.

**The grand objective**

The objective of e-commerce is to have internal applications of the company talk directly to the internal applications of all trading partners without anyone in between.



**Figure 7 The objective of e-commerce**

Electronic commerce is thus at its heart a trans-enterprise application integration challenge.

**Direct materials**

Not all electronic commerce is created equal. More precisely, not all electronic commerce holds the same importance or urgency for a Global 2000 chief purchasing officer.

The most obvious distinction in electronic commerce is the difference between customer and supplier. A corporation deals with customers and suppliers completely different, and has different accounting systems to handle them; namely, accounts

payable and accounts receivable. Our focus on the chief procurement officer implies that we are dealing with suppliers.

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New with 5.0

The focus on direct materials is the most important strategic change between 4.2 and 5.0. The focus on direct materials actually drives the change of focus from the CIO to the chief procurement officer.

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The most important distinction in electronic commerce, however, is the difference between direct and indirect materials. Direct materials, or strategic materials as they are sometimes called, are the materials that go directly into the products or services the company provides. Engine parts, for instance, are direct materials for General Motors. Indirect materials, also called *maintenance, repair and operations*, are all the materials that do not go into the product but are necessary for the running of the company, including the factory line itself. Toilet paper and pencils are indirect materials.

Let's walk through an example. Lubricants that go in the car itself are direct materials and the lubricants for the factory floor machinery are indirect materials. Different people make the purchasing decision by different means and for different purposes, even though it is the exact same product, perhaps even from the exact same supplier. The engineering department that designed the car knows how much lubricant is needed in each car. The cost is built into the car and ordered based on the number of cars to be sold. The factory operations department knows how much lubricant is needed for the machinery. The cost is built into the overhead and is ordered based on the number of hours the factory is running (which is actually independent of the number of cars). The purchases are of course accounted for differently by the comptroller.

XMLSolutions is focused, as a company, on direct materials procurement for the Global 2000. There are, however, other dimensions of purchasing that must also be accounted.

```
Commerce_type = {(supplier|customer),
                 (direct|indirect),
                 (strategic|transactional),
                 (material|enabling),
                 (catalog|spec),
                 (product|service)}
```

#### Equation 1 Multiple dimensions affect electronic commerce behavior

***Transactional and strategic.*** Purchasing departments establish relationships with suppliers. They set up a schedule or rates and transact from them. The process of sending purchase orders and invoices is *transactional purchasing*. It assumes that another process has occurred, which we will call *strategic purchasing*. Strategic purchasing is the process of discovering a supplier and negotiating the means by which transactional processing will occur. Sometimes strategic purchasing occurs for only one transaction, while other times it establishes a relationship that lasts for years.

***Material and enabling.*** Most large purchases of materials include secondary transactions for transporting the material, financing the material and insuring the material. These secondary transactions we call *enabling transactions*.

***Catalog and spec.*** As individuals, we are most accustomed to purchasing products from catalogs. Most of us have ordered office supply products and other indirect



compunction for cost savings is not enough to explain the phenomenon of electronic commerce.

People don't get out of bed and say to themselves, "I'm going to cut cost." They get out of bed and think, "I'm going to increase revenue," or "I'm going to increase market share," or even, "I'm going to enter a new market."

Electronic commerce is a two-sided coin: it is revenue as well as cost. The compelling reason for electronic commerce is not to save cost. It is to increase revenue through increased market share or new markets without dramatically increasing costs.

How does electronic commerce help a company actually achieve these goals? It depends on what size a company you are. That is, large companies and small companies achieve increased revenue and cost savings from electronic commerce in completely different ways.

Large companies are not looking for more market awareness. The Internet is not going to let anyone new know about General Motors or General Electric. They are looking to increase customers by delighting customers. [etc]

Small companies are looking to increase customers by increasing reach and awareness. It costs more for a small company to process an electronic purchase order than it does to process a paper one. [uzw]

It's like soccer. Who cares if you get two goals against you if you score five?

## Agile manufacturing

Electronic commerce can provide a direct return on investment (ROI) by replacing clerks and their mistakes. However, I do not believe this ROI is driving the business decision. I believe that large companies are investing in electronic commerce in order to be able to respond to customer demand quickly. They see strategic advantage in it, and are willing to make a sizable investment to gain market share that exceeds an investment that would be justifiable by simply replacing clerks.

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New

[Agile manufacturing is an important and newly identified secondary objective.](#)

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General Motors and other automotive manufactures have announced an N-week car. A customer specifies the configuration of color, interior, amenities, etc., that they wish and the car is manufactured and delivered in N weeks. The value of N varies between companies. This process varies drastically from the current process where the customer looks through the existing available inventory for a close match. In order to meet this objective, General Motors and its supply chain must be much more agile than they are today. That agility comes through new processes enabled by tighter electronic communications.

Boeing has also announced that it intends to shorten its order lead-time from three years to one. The same principles apply.

## Secondary objectives

Global 2000 companies have the grand objective in mind when they say e-commerce. The customer has many secondary objectives as well that we should also be cognizant of.

### Consolidation

Many Global 2000 companies are products of multiple large-scale mergers conducted during the 1990s. Lockheed, Boeing, Kraft, Pennzoil, Bank of America, and FirstUSA have all recently passed through a major acquisition. As such, these companies have redundant internal systems for accounting, order entry, inventory, etc. More importantly, they all have multiple trading policies.

A trading policy is the collection of documents, the particular fields in those documents, and their sequence of exchange. For instance, some companies want a purchase order acknowledgement whereas others want an invoice. It goes much further than that. Some divisions of Lockheed use a phone number as a trading partner identification while others use the DUNS number.

Global 2000 companies want to consolidate their trading policies before or while they are consolidating their trading systems. Since Global 2000 companies are really a company of companies, consolidating trading policy makes the G2K itself an e-commerce portal.

### Measurement

If they are successful in consolidating their trading systems, these companies are very interested in setting up metrics and reports on all their trading data. This provides a means of measurement that is not available within the ERP systems. It is exactly what Kail calls “looking into the pipe.”

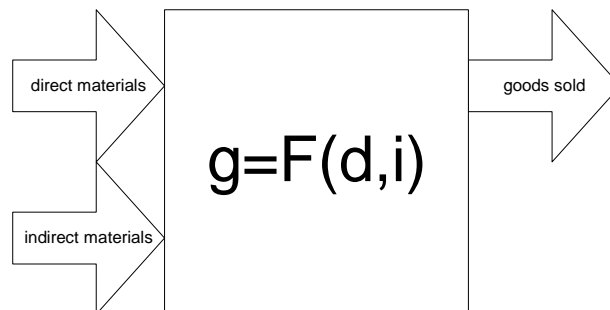


Figure 9 Black box function for business intelligence

### Managing trading partners

The people who use or manage e-commerce software focus almost entirely upon the process of setting up and managing trading partner data. The actual movement of documents is not their concern until something goes wrong. These customers are very interested in the ability to manage distributed trading partner data without having to replicate the information in several places as is now the practice.

### Managing transactions

True e-commerce requires managing long-lived transactions and non-consecutive transactions. These transactions can fail at any point along their life. They cannot just

go off in to space. Large companies have to be able to track and even roll back transactions across corporate boundaries.

### **Migration from EDI**

All the companies we have spoken to welcome our approach to leveraging the existing EDI investment to bring XML-based e-commerce up very quickly. However, the all are very adamant that they want to eventually remove their EDI systems and move directly from their internal systems to XML.

### **Business *not* as usual**

Most profoundly, all the senior IT executives seem completely infected with a firm, almost religious belief that business can *not* continue as usual. They know absolutely that they must change; they just are not quite certain what they should change to. (I don't know what the economic or marketing term for this sort of situation is, but socio-political science it's called the *Messiah Effect*.) The result is that the market is a giant vacuum. The first person with a sound and compelling story will sweep the landscape.

### **Supplier managed inventory**

Supplier managed inventory is the first move large companies make towards business as unusual. The idea is simple but the results can be staggering. Currently companies send a purchase order every time they need an inventory item. Commonly these companies will set up a blank purchase order and execute from that. Nevertheless, the process is identical. Blanket purchase orders are a meager improvement.

Supplier managed inventory is dramatically different. Rather than order supplies, the company simply provides the supplier data and lets him decide when and how much to send. The customer provides the supplier: minimum and maximum quantities expected, current inventory and projected usage.

Boeing has implemented this system in Wichita. Inventory turnover changed from one per year to 20 per year. That is a significant impact on the bottom line, so much so that Merrill Lynch mentioned the application as a strategic asset in their analysis of Boeing.

Ethyl has also implemented supplier-managed inventory. They view it as an essential strategic advantage over their competitors.

### **Preferred vendors**

Global 2000 companies have preferred vendors that they have pre-qualified. Often during strategic purchasing only preferred vendors will be contacted in order to shorten the cycle.

### **Efficiencies outside the company**

Automotive and petrochemical are very mature industries. As such, the companies within those industries have consistently squeezed out efficiencies within their organizations for so long that there is really not much more than can be squeezed. These companies have thus turned their attention outside their walls to look for efficiencies. This is the drive for supply chain management.

As these companies such as GM and Ethyl begin down the path of supply chain management, they all make the same startling discovery. If each of the large players executes supply chain management, then the system only becomes more complex, not less complex. Each of the major players shares the supplier base. It is infeasible for the supply base to install three different proprietary supply chain management systems.

Hence the advent of clearinghouses.

## Learning more about the customer

### Product marketing and product development

To explain the relationship between product management and product development, I would like to provide an analogy.

Within Fidelity Investments, there are mutual fund managers. These managers are responsible for the growth of the fund. They decide what stocks the fund will buy, sell or hold. Fidelity also has an equity research department. The researchers are experts in particular securities and markets. They analyze the securities and make recommendations to buy, sell or hold. The manager makes decisions based on the recommendation, not dictated by the recommendation.

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Lesson learned since 4.2

[The role of product marketing needs clear definition to distinguish “market driven” from “marketing department driven”.](#)

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The primary mission of product marketing is to collect and quantify customer expectations and requirements from all the various channels of contact with customers and prospects. These channels include the sales force, the customer support desk, the professional services team, trade magazines, as well as formal market research.

Secondary missions include competitor analysis and partner evaluations.

---

Important!

The number one shortcoming in our current documentation of requirements is case methods. We need case methods for how Global 2000 companies procure direct materials. This need is not adequately addressed in this document. The demand for procurement case methods is a perfect example of how focusing on the procurement officer changes our strategic thinking. The examples that follow here from the 4.2 version are framed from the CIO's point of view.

---

### What is the existing infrastructure?

It is very important that we begin to create a solid, detailed image of the computing infrastructure of our customers and prospects. By detailed, I do not mean that every spec of minutia should be gathered, rather I mean specifics should be gathered, not generalities. For instance, we don't want to know they have an ERP system. We want to know they have an SAP R/3 version 4.03 with modules AB and GH installed at four of their divisions. I'm making up these details up, but you get the gist.

These intelligence requirements should be jointly designed by development, sales, marketing and professional services. Sales and professional services should populate the database. The latter are the people on the ground with access to confirm the information.

The reason for this priority is simple. The objective of e-commerce is to integration existing applications within and between different companies. What are those existing applications?

### Lessons from the battlefield

Immediately prior to forming this company, I ran a military intelligence (MI) platoon. I think we can employ some of the techniques used there. (No, we are not going to interrogate anyone.) Here is how it works. The G2 (that's intelligence) creates an intelligence preparation of the battlefield (IPB). This is simply a summary of the friendly and enemy strength and situation as well as environment such as weather and terrain. This is directly equivalent to a corporate marketing strengths-weaknesses-opportunities-threats (SWOT) analysis for ourselves and our competitors, combined with a detail of the competitors product mix (his forces), the market and the economy (the terrain and weather.)

From this IPB, the commander and the G3 (operations) form a plan of attack.

All intelligence on the battlefield from there on is driven by what is called the commander's priority intelligence requirements (PIR). This is important. In making their plan, the commander and G3 had to make certain assumptions. They made contingency plans in case their assumptions are wrong. The commander's PIRs are indicators of whether his assumptions are right or wrong. The scouts on the battlefield are thus sifting through all the data looking for those PIRs.

I'll give you an example. There are two roads the enemy can come down. The commander needs to guess which road will be the primary axis of the enemy attack so he can put most of his forces there. He has to make a decision, so he chooses the south road. The enemy always precedes his primary force with a special vehicle that detects chemical agents. Our commander does not want to know all the vehicles coming down the two roads. His priority intelligence requirement (PIR) is simple: *Is the chemical detection vehicle on the north road or the south road?* If the chemical detection vehicle is on the north road, then he needs to shift his forces.

---

#### Reality check

We never have all the information we want or expect. The reality is, we always have enough information to make a decision. Even in a completely black room, you can make a decision to walk forward. The key is to prioritize our information gathering and, more importantly, make full use and dissemination of the information we have.

---

### First stab

In the absence of perfect information, we have made certain assumptions about our customers and our competitors and committed our resources accordingly.

| System               | Questions  |
|----------------------|--|
| EDI                  | What EDI translator(s) do you have installed?<br>How many trading partners online? How many total?<br>What version of what documents do you use? |
| Accounting           | What vendor, what version, what OS, what language?   |
| Order entry          | “  |
| Inventory management | “  |
| Webserver            | Have you standardized on a webserver?  |
| Metadata             | Do you have a metadata repository?<br>Do you have a Y2K inventory database?  |

**Table 2 Sample market research questions**

The key is to find a very small set of questions that provide us a very clear picture of their environment. Execution is critical. We do not simply hand the company a form that they fill out. Instead, we ask questions throughout the day and fill in the form later. Remember that we don't need to know their entire system, only those pieces that directly effect e-commerce.

We must also get a feel for what their trading partners have. Remember the objective of e-commerce. I have asked Boeing, Lockheed and Kraft if they would be willing to create a survey sampling of their trading partners to find out what applications they have on their end. They all said yes.

The trading partner survey is just as important as the customer survey. It tells us who we must partner with in order to increase the value of our products to our customers.

- How many employees do you have?
- How many locations do you have?
- What accounting software do you use, including version and OS?
- What order entry software do you use if any, including version and OS?
- Does your company use online banking?
- Do you have a dedicated Internet connection?
- How would you prefer to be notified of an electronic PO: email, fax, or pager?

It is even more important that the trading partner survey be as minimal as possible.

# Guiding principles

*The essence of business strategy is determining what you will not do.*

## Determining what to build

### Best of breed

We build e-commerce software for Global 2000 companies. E-commerce is a very, very large problem. As a company we have a choice: (1) try to solve the entire problem or (2) try to solve particular pieces of the problem very well.

---

#### Note

[This section has not been modified since version 4.2.](#)

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It is not beyond a small company's capability to do approach (1). A good example is Silver Stream and their web development solution. They built everything, from editors to application engine. Another example is the Progress database used by Arc Systems. Progress is a database, a programming language, an application server, etc. No one piece of their solution excels. Silver Stream and Progress stand out by having the minimum necessary set of features. Such companies attract certain customers that are willing to compromise features and performance for the sake of simplicity of dealing with one vendor. These solutions quickly become labeled as proprietary and legacy. These complete solutions generally do not cooperate well with other software because there is no perceived need to cooperate. For example, Progress does not yet have an XML processor written in its proprietary language. Even if they open up their architecture, they have under minded their primary strength of simplicity.

It is beyond the scope of a small company to do every piece of a large problem very well. Not even the largest companies such as IBM and Sun Microsystems can be best in everything. The alternative is to solve particular pieces of a very large problem very well. This approach is called being "best of breed."

XMLSolutions is resolved to take best of breed approach to Global 2000 e-commerce software.

### Must have, should have, could have

We realize that out of all the problems we could solve for the customer, we will only be solving a select subset. We must have principles upon which we as a team gain consensus on what problems we will tackle and what problems we will leave for others. 'Tis no mean task that.

From the customers' perspective, software can be categorized as must-have, should-have and could-have. I believe these categories are self-explanatory. I will provide an example all the same. A travel management package is software that helps manage and track travel costs. Today, every small company *must* have an accounting software package, *should* have a website with email, and *could* have travel management software. Large companies *must* have a human resource management package, *should* have a travel management package, and *could* have a knowledge management system. Size and time change different software from could to should to must, but the distinction can still be made.

At this point in our existence, we as a company must focus on building must-have software.

So far I believe we have lived up to this principle. Companies exist to build and sell products and services. E-commerce software is vital to their existence; it is must-have software. The objective of e-commerce is to have application in company A talk directly to application in company B without anyone in between. The key to this trans-enterprise application integration is semantic matching, which is based on metadata. Thus, metadata management is must-have software for e-commerce.

We must continue to apply this critique to the products we plan.

### **Speed is everything**

“Firstest with the mostest wins.” Every US cavalry officer learns this Civil War quote. It could just as easily have been coined for our industry.

The first to market with a viable solution wins.

This glaring market dynamic is the overriding strategic concern. If we do not have first, we have nothing.

So far we have been first. We were first with server-side stylesheets, we were first with EDI-XML, and we were first with XML metadata management. We must continue to be first with our products. If we are not confident that we can be first, then we should think twice about pursuing it.

### **Don't build nothing you don't have to build**

Wallop Software was one of the best technology startups on 1996. I watched that company collapse under the drain of its development team and its pricing model (but the later is the concern of another team.) Wallop missed the release of version 3.0 of its product by 18 months. In fact, version 3.0 was not released until after IBM acquired the assets of the company (i.e., they folded.) The development team spent all their effort building a workflow engine rather than using an off-the-shelf engine and focusing their efforts on the capability nobody else had, which in Wallop's case was managing web development metadata. One of the lead developers had built a workflow engine before and was determined this time to build it right from the ground up. To hell with consequences, and to hell they went. (This same developer believed he had personally solved the riddle of human cognition, worshipped Minsky and pooh-poohed Penrose. This should have been enough warning sign to anyone, but alas.)

If we leave ourselves unchecked, we as developers will tilt at windmills, take on Mount Everest, build software simply because we know it can be built. It requires diligent self-reflection not to fall into this trap. We must focus on the customers' problem, be first to market, partner well, and not build anything we don't have to build.

### **Own a dominant point of leverage**

Our situation is not unlike the personal computer industry. No one company, not even IBM, makes all the things necessary for a personal computer. Out of the hundreds of companies involved, there are two companies that hold dominant points of leverage: Intel and Microsoft. Microsoft owns the operating system, graphical user interface, the part the customer interacts with and identifies with. Intel owns the “guts” of it and

through its dominance has forced its identity on to the consumer. Otherwise, without the “Intel inside” jingle dictated to the OEM partners, few people would be aware of who Intel is, regardless of its size.

Currently XML-EDI is a dominant point of leverage in electronic commerce. Direct materials are now the focus of nearly every e-commerce provider. EDI is strongly entrenched in the direct materials transaction market. Anyone wanting to play in this space must cross the XML-EDI bridge.

The battle shifts and moves forward. A point of leverage today is not a point of leverage tomorrow. Intel constantly made the chips obsolete through Moore’s Law. Microsoft reinforced its operating system through office suite software, and vice versa. We cannot expect XML-EDI to be a point of leverage forever.

It is my intent to make the consolidated trading partner management console a point of leverage in the industry.

## Determining how to build it

### Capability first, performance second

With the products we have built so far, we have focused on capability first and performance second. This approach has allowed us to be first to market. Our customers are Global 2000 companies. Their buying decision processes are slow. They pilot technology before they take it production. They take time to integrate technology into their systems. They take a while to distribute the technology throughout their large organizations. All of factors provide us time to improve the performance of our products.

Global 2000 companies have become cynical over the past decade. They are use to software companies making claims that they cannot deliver. By focusing on capability first, the clients can actually see the product work. They see that it is not vaporware. This greatly improves our ability to close.

---

#### Lesson learned since 4.2

This strategy applies best to product areas that do not currently exist. In those situations where a product or products already exist, then the opposite strategy must be taken, that is, performance first and capability second. To upset an existing product, we must have very high performance on one or two distinguishing capabilities. We gain market penetration with those customers for whom that particular capability is the decision point. We then expand capabilities from there.

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### Use open source

One way we can build faster than our competitors is to leverage open source software. We should OEM code where affordable and acceptable, but we should not be afraid to use open source. See the open source instructions in the Corporate Software Development Guide.

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#### Issue

The use or rather embracing of open source software requires strategic commitment from all technology leaders within the company.

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### Component-based architecture

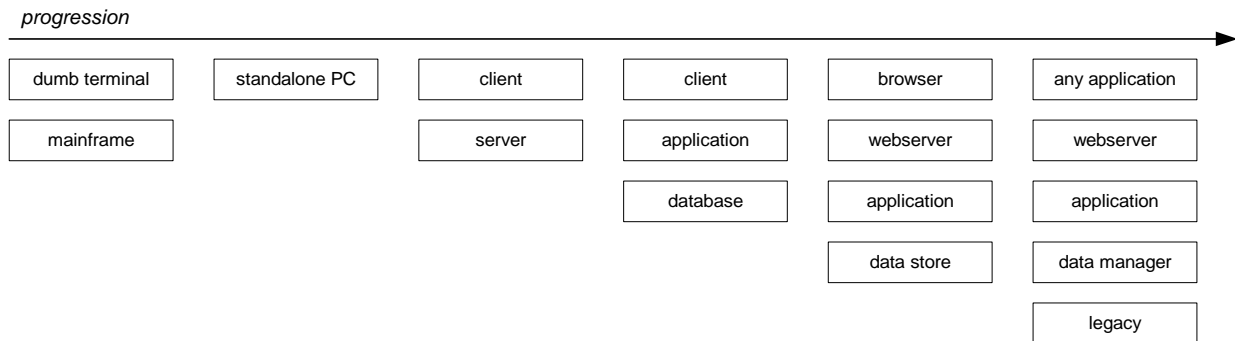
One of the major reasons (from a very long list) that JP Morgenthal is our CTO is because he understands and evangelizes component-based architecture better than anyone I have every read, let alone met.

Engineers break problems down into smaller, simpler problems based on the tools they have available to them. As software engineers, the tools we use are mental tools. Object-oriented modeling is a mental tool. It is an approach to breaking a large problem into smaller more manageable problems.

You all must be equipped with the component-based approach to problem solving. Component-based architecture is vital to code reuse and rapid development. For a sound example, see **Error! Reference source not found.** on page **Error! Bookmark not defined.**

## N-tier architecture

Software development has made a progression over the past three decades from mainframe, to desktop, to client-server, to three-tier and finally N-tier architectures. This progression in architecture has matched the progression in hardware and network capabilities.



**Figure 10** The progression towards N-tier architecture

The web-based application was a large step forward from three-tier architecture. It allowed a universal thin client access to applications independent of the operating system of either the client or the application, and equally independent of the particular networks. Large corporations took advantage of this breakthrough by fielding large intranets.

With the advent of XML, two major improvements have been made to web-based architecture. First, the client need not be a web browser. It can be any application capable of parsing XML. XML parsers are now available for free in major programming languages. Second, the data store is no longer assumed to be a stand-alone database created specifically for the application. Most of the information that large companies need to run their business already exists in legacy databases such as DB2, IMS and VSAM. XML-based applications are able to go directly to the existing source rather than creating copies or pockets of data.

N-tier architecture enables us to quickly deploy enterprise-scale applications.

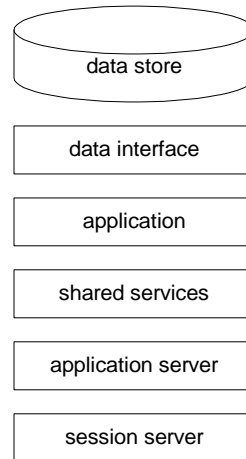


Figure 11 N-tier architecture

### Peer-to-peer (recursive) architecture

Complex systems are built by combining the behavior of simple systems.

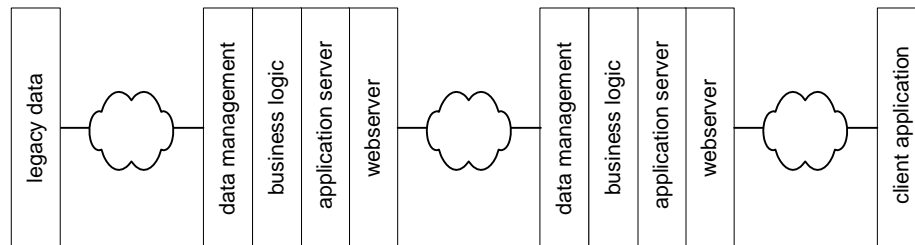


Figure 12 Recursive architecture

XML allows recursive web-based architectures that were not possible with HTML. An XML-based application has an N-tier architecture. The webservice handles session communication with the client. The application server handles load balance, multithreading and other common issues. The actual business logic of the application runs within the application server. The business logic processes data that is provided by the data management tier. The data management tier abstracts the data source, allowing the business logic to treat all data sources as if they were a collection of XML documents. The data could be flat files on the disk drive, a relational database, or a legacy IMS system.

The result is that an XML-based application takes XML in and spits XML out. The data source of an XML application can thus be another XML application.

### Partner early and often

Global 2000 companies do not buy software at the CIO level. They buy solutions to business problems. The CIO is looking for the complete solution. Since we do not provide the complete solution to e-commerce, it is imperative that we have partners that complement our software.

Our software partnerships can either make us or break us.

Capitalism rewards risk. Solving the whole problem closes off the risk of partnerships, but at the same time precludes a majority of the market. Lower risk means lower reward. Taking a best of breed approach incurs the risk of dependency

upon good partnerships. However, it enables a much greater market and thus greater reward.

### Provide a road map

Global 2000 companies understand better than anyone that everything does not happen at once. These clients deal with and expect migration paths of technology. Do not blow smoke and do not claim capabilities we do not have. If you are found out, and you always are, you will have lost the confidence of the customer. You can with good confidence tell the customer, “Here are the features we have today, and here are the features we are bringing on and when.” It is our duty as the development team to provide this level of information to the customer through the sales, customer support and professional services teams.

## Our approach to the solution

### Why metadata?

An immediate question should be, “Why metadata?” Why would a company focused on business-to-business e-commerce be involved in metadata management?

The answer lies in the OSI model of networks.

The seven layers of the OSI model are used to describe and compare network architectures. Take the web-based application model shown above. The web allows one-to-many systems integration. A browser can integrate with any application so long as that application is sending HTML over TCP/IP using HTTP.

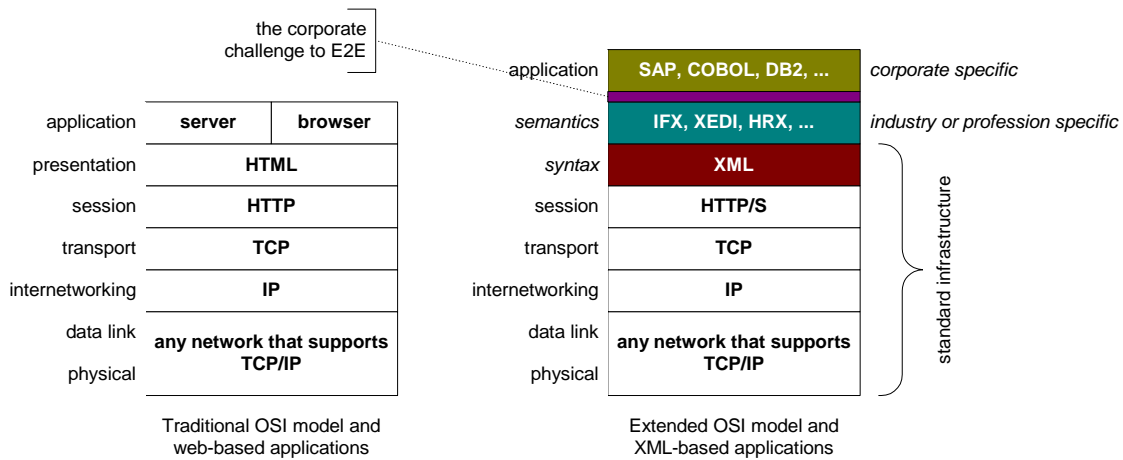


Figure 13 OSI model of networks

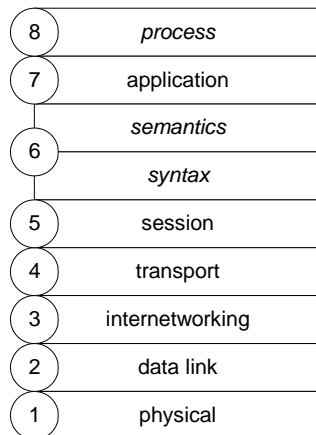
In order to explain XML-based applications, we have split the presentation into two separate layers: syntax and semantics. The syntax is always XML. The semantics of exchange are different for each industry or profession. Organic chemist use chemical markup language (CML) while consumer bankers use open financial exchange (OFX).

Our customers’ challenge is that little line between the semantics and application layers. (We have expanded it into a fat purple line for clarity.) How do they integrate the industry-specific semantics with their existing internal application semantics?

## Why workflow?

When conducting e-commerce, you are not integrating business data; you are integrating business processes. Access to a purchase order is access to the purchase order process. Call it transaction management, process flow or workflow, the objective is fundamentally the same: manage an automated business process.

When managing a business process, you manage the metadata, not the data. The key to web-based workflow is web-based metadata. That is what XML is. The search for web-based workflow is what brought me to XML to begin with.



**Figure 14** Extended OSI model for electronic commerce

A more fundamental explanation lies again with the OSI model. The OSI model is used to explain how two applications integrate across a network. Why would two or more applications be integrated to begin with? The answer is that they are part of a business process. The process is larger than the individual applications themselves. It spans the applications. Thus, I propose that yet another layer, an eighth layer, be added to the OSI model called *process*.

## The customer gets it

I have not yet had to argue the logic of this explanation. Every Global 2000 customer I have spoken to so far immediately gets this:

Metadata management and workflow are the keys to e-commerce.

# Product overview

## Product vision

Enable trans-enterprise application integration to be built and maintained by scripters.

## Product mission

It is my intent to own the direct materials procurement domain of a Global 2000 company from the time a message leaves an existing internal system, such as a mainframe or an enterprise resource planning system, to the time it is sent across the internet to the trading partner, and vice versa.

We will own this domain by providing the chief procurement officer a single, consolidated console for managing and monitoring the communication between trading partners from a business process perspective. That console will require an ability to manage processes that dictate the movement and transformation of information, as well as the movement and transformation itself.

## Product concepts

We will never replace the existing applications that run the Global 2000. No one will. The enterprise automation of the Global 2000 varies substantially, from complete to archaic. There is no trans-enterprise automation between Global 2000 and their trading partners except EDI. We will work with automation where it does exist; we will enable automation where it does not exist.

The product will be business-process-centric rather than document-centric, remote-procedure-call-centric, or even transaction-centric. To achieve this, we will follow a kind of particle-wave philosophy: processes will be treated as documents and documents will be treated as processes.

---

### Conceptual note

At the beginning of the last century, physicists were locked in debate on whether quantum level entities like photons and electrons were particles or waves. The parent entities were atoms and light. Atoms acted like particles and light acted like waves, but their subcomponents had the properties of both particles and waves. The resolution lied in realizing the power analogy and metaphor hold over our thinking. We can know nothing but how it compares and contrasts to other things. We cannot experience subatomic particles, so we understanding them by comparing and contrasting them to things we have experienced such as particles of sand or waves of water. Subatomic particles are neither particles nor waves; rather they are *like* particles and *like* waves.

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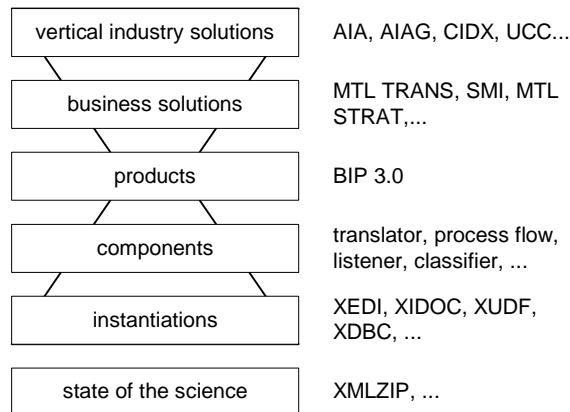
The product will make no assumptions of the client. We will be able to operate in a completely degraded mode, that is, a browser on one side and a command line interface on the other.

We will enable the complete direct materials procurement space, to include catalog as well as spec, supplier managed inventory, enabling as well as material, and, most importantly, transactional as well as strategic.

## Product reference framework

That we have only one product can be misleading. We talk of many things that need to be built that are not necessarily product. In order to help facilitate the discussion of what we are building, I present to you a six-layer reference framework. I call this the

five-ass monkey model, for obvious reasons. The reference framework begins in the middle with one product and expands from there.



**Figure 15 Six-layer reference framework**

The product has many components. For instance, Business Integration Platform (BIP) 2.0 has the XEDI Translator, Schema Central, Mapper, Translation Daemon, etc. With 3.0 and later versions we will add more components.

Some of the components have many instantiations. Our XEDI Translator, for instance, can be instantiated as an IDOC translator, a UDF translator, a MILS translator, etc. Many of the new components for 3.0 are this way. For instance, the Listener can handle any number of session protocols such as HTTP, SMTP, FTP, etc. The Classifier can handle any number of document types such as XEDI, CBL, CXML, RosettaNet, OAG BOD, etc.

Moving forward with versions, we will begin to expand into more of the electronic solution space, starting with transactional material purchases and moving into supplier managed inventory, strategic purchasing, etc. These new business solutions will require additional components. A map of the business solution space is shown in Figure 16.

We can customize the business solutions for particular vertical industries. We can do so by providing the specific message structure subsets that the industry uses. However, with BIP 3.0, we can also begin to provide the specific business *processes* used in the industries.

There is a sixth category called *State of the Science*. A good example of this sort of development is XMLZIP. The name of our company is XML. We are the first company formed dedicated to XML technology. People expect some industry leadership from us. We will apply a certain percentage of our development efforts to advancing fundamental capabilities necessary for XML based application development. We will incorporate these capabilities into the components we build, of course, but they will have a much broader purpose than just our component needs.

## Business solutions

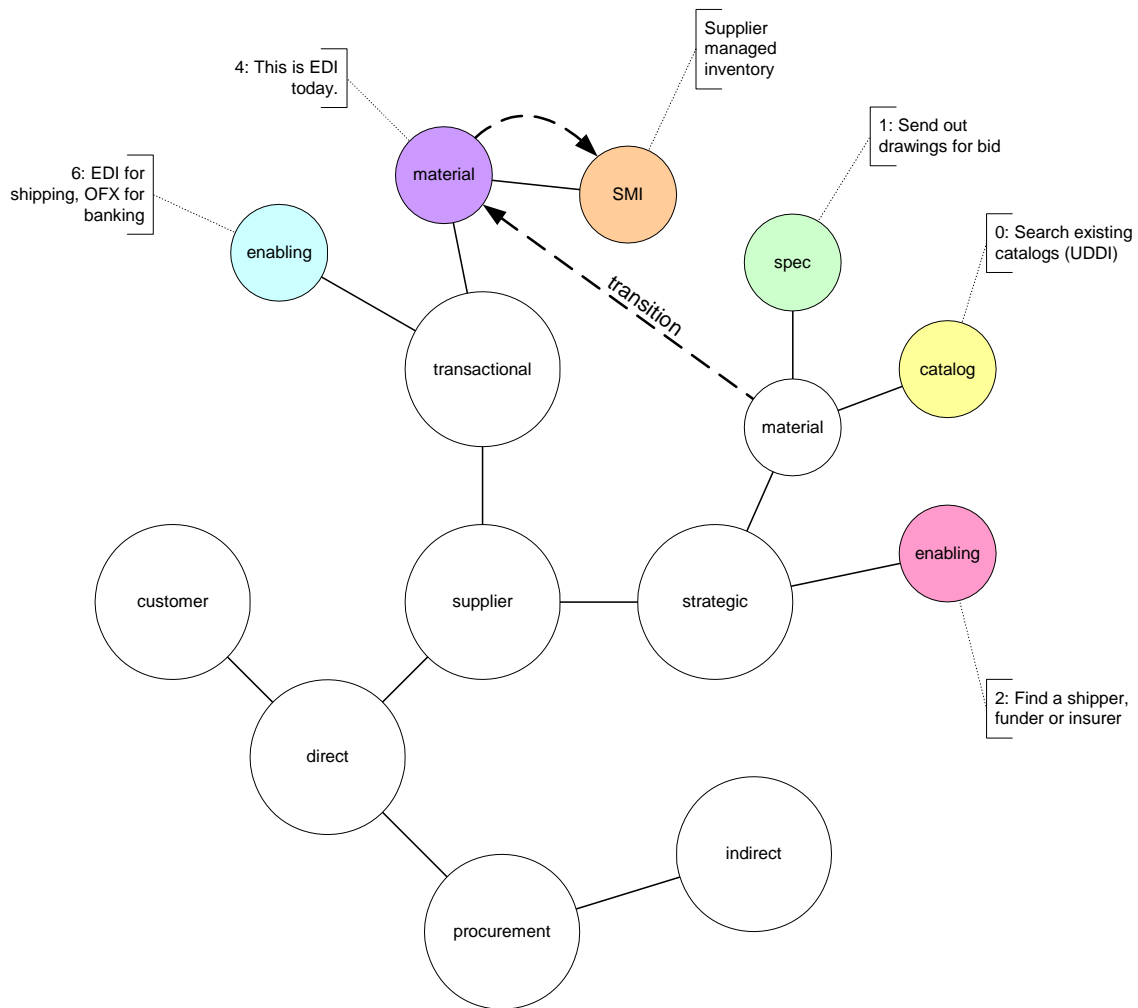


Figure 16 The electronic commerce solution space

### Material transactional

The arrival of documents from internal applications kicks off a process of transformation, logging and routing to a trading partner.

The arrival of documents from across the Internet kicks off a process of translating, logging and posting to internal applications.

Processes have trading entities as participants. If the documents are from applications then the listener sets the process participant identifier.

Web front-end works through work items and work lists.

### Supplier managed inventory

The procurement manager provides five data points to the supplier:

- The product identifier
- The current inventory
- The projected consumption

- Historical consumption
- Minimum and maximum inventory expected

The supplier provides the following data:

- Shipment events
- Projected shipments

The product should receive batched reports from internal systems, consolidate them and transform them into XML documents for the trading partners.

### **Enabling transactional**

Additional processes may extend material transactions to automatically include enabling transactions such as shipping and financing.

### **Material strategic catalog**

Allow UDDI registry of trading partners.

Search UDDI registry

Allow transition from strategic find to transactional trading partner through establishment of a trading partner agreement

### **Material strategic spec**

Allow exchange of STEP documents

Enable threaded discussions and posting of arbitrary documents

### **Enabling strategic**

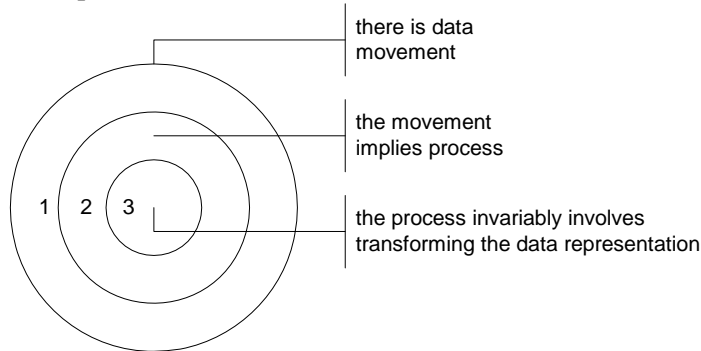
Search for best-fit enabling services for a particular transaction

# Architecture

## Fundamentals

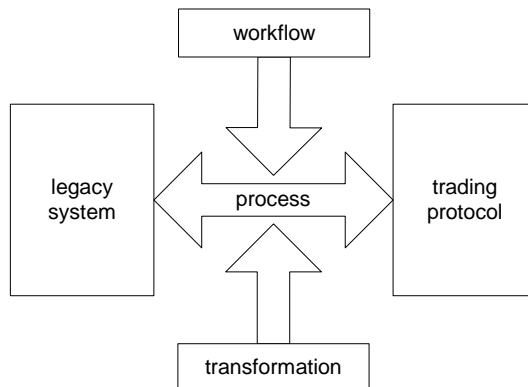
The fundamental architecture is based on three concepts:

- There is data movement between applications
- The data movement implies a process
- The process will invariably include some transformation of the data representation



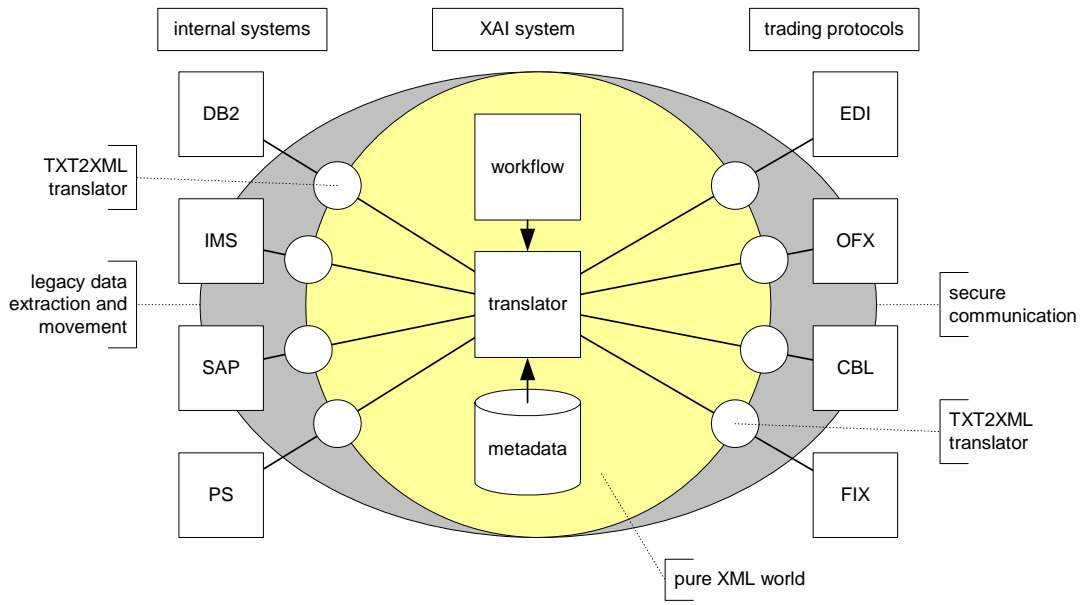
**Figure 17 Fundamental architecture**

From a Global 2000 company's perspective, the data is moving in and out internal legacy systems or ERP systems. It is going to and from trading partners in the form of a trading protocol, such as EDI or CBL. The process is a workflow issue.



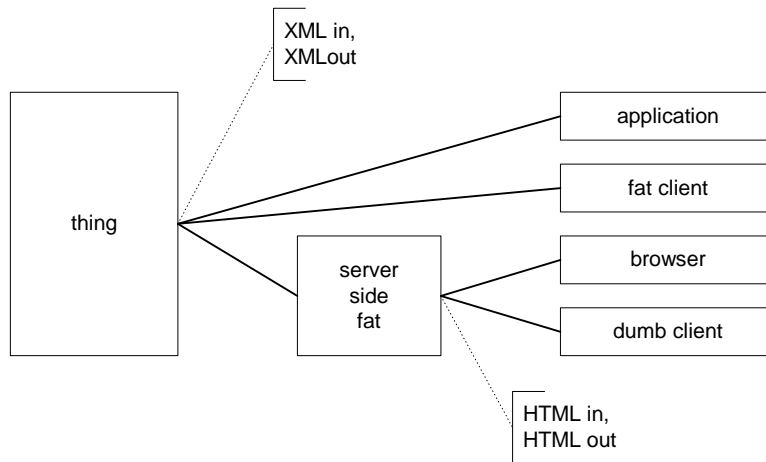
**Figure 18 The most basic concepts**

The transformation, in order to be managed properly, implies metadata management. We have learned that managing the information in a normalized syntax like XML makes the challenge of translation exponential easier.



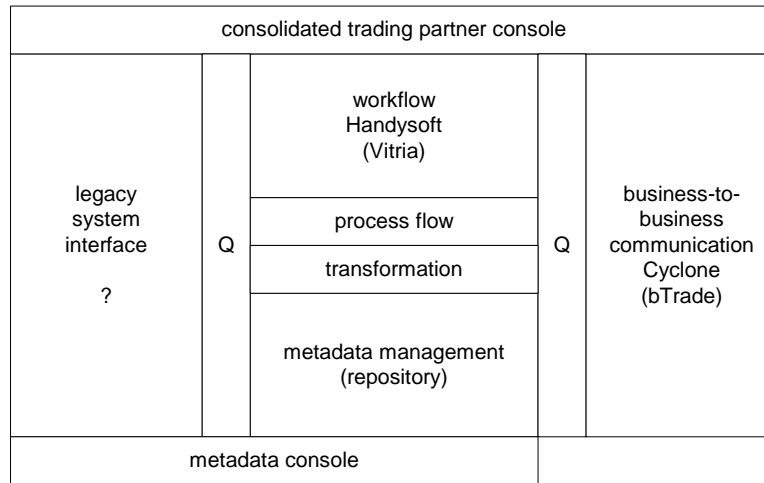
**Figure 19** More complete picture of challenge

Our canonical form will be SOAP-based workflow. Trading partners will be workflow participants. We will add layers to emulate other older modes such as EDI and xCBL.



**Figure 20** Server side fat

## Component flow



**Figure 21 Simplified view of the component flow**

Many of you will recognize some slight changes to the component flow diagram.

First, we have added a queue to the structure. There is no way to insure a match of throughput between the workflow and the communications or the workflow and the legacy system interface. Sometime documents may arrive faster than the workflow can process them, or sometime the workflow will generate documents faster than the legacy system or communications can ship them.

Second, we have distinguished between workflow and process flow. Workflow exists at a macro-business level and works its way down. It begins with a process as nebulous as *acquisition* and drills down to the actual exchange and approval of specific documents. Process flow, on the other hand, exists at the atomic level and works its way up. It begins with a specific API call and expands to include a sequence of application calls that make up a process such as *process purchase order*.

There is no solid boundary between workflow and process flow. To achieve enterprise strength electronic commerce, one needs both. Process flow can never effective scale to encompass all the business processes of a company. Likewise, workflow can never provide the speed and throughput necessary for enterprise wide acquisition process. XMLSolutions provides workflow through BizFlow and process flow through our Process Flow Object.

### Inbound message

- Cyclone receives a document from the Internet. It identifies the document type and, if it is an EDI or XML document, the sender and receiver identifier. Cyclone places the document in the queue for the appropriate process.
- The queue calls the appropriate BizFlow process based on the data provided by Cyclone and hands it the document as a parameter.
- The BizFlow process executes a series of transformations on the business document, which may include human interaction such as an approval. BizFlow calls the Transformation Daemon, the XEDI Translator, the Process Flow Object and other applications as workflow activities.

- BizFlow hands the resulting document(s) to the queue to be sent to internal legacy systems. [Issue: Should BizFlow call the queue as an activity and await an acknowledge that the document was processed successfully?]
- BizFlow may also hand documents such as simple acknowledgements (977) to the queue to be sent to Cyclone.

### Outbound message

- The queue receives a document from the legacy system. Either the legacy system writes the document to disk and calls the queue or there is a tighter integration.
- The queue calls the appropriate BizFlow process based on either the legacy system or the document location and hands it the document.
- The BizFlow process executes a series of transformations on the business document, which may include human interaction such as an approval. BizFlow calls the Transformation Daemon, the XEDI Translator, the Process Flow Object and other applications as workflow activities.
- BizFlow hands the resulting document(s) to the queue to be sent to Cyclone. [Issue: Should BizFlow call the queue as an activity and await an acknowledge that the document was processed successfully?]
- BizFlow may also hand documents such as simple acknowledgements (SAP has this feature) to the queue to be sent to the legacy system.

### Component architecture

See Kevin Mitchell’s architecture document.

### Network configuration

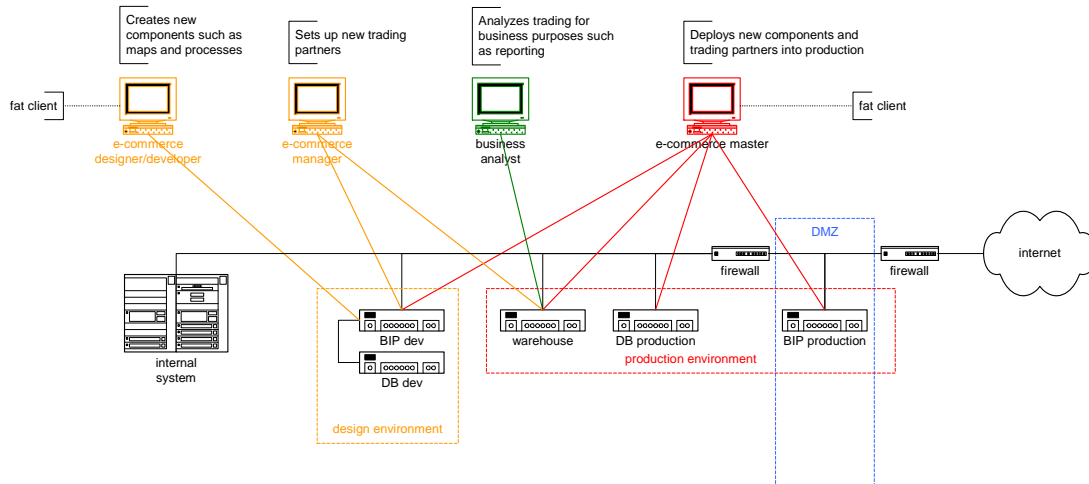


Figure 22 Network configuration of BIP

# Partnerships

*Partnerships are a dominant consideration in our 3.0 development.*

## Introduction

We partner with companies for five different purposes:

- To reach medium and small companies
- To enter new vertical markets
- To complete our product mix
- To complete our product stack as part of a n-tier architecture
- To generate revenue through a channel

I will discuss each of these in turn. Before I do, however, I want to address some basic philosophy that affects our partnering.

- Half of something is better than all of nothing
- Do not build anything you don't have to build
- Speed to market is everything
- Don't say anything to anyone that you would not say to Philip Merrick's face
- The value of an e-commerce solution is *exponentially* proportional to the number of companies that use it

## Customer size

It has been my assumption since before this company was officially formed that we would focus on the Global 2000 as our customers and work through partners to reach the small and midsize companies.

- Large companies: direct client control of the Global 2000 companies. Product marketing and corporate message completely focused on the chief procurement officers of these companies.
- Midsize companies: work with partners to do systems integration work. Use the Global 2000 as a channel to these companies
- Small companies: give away the knowledge and tools necessary to do simple custom integration.

The objective of e-commerce is trans-enterprise application integration. The challenge is very different for large, medium and small companies. By medium size, we mean companies with 50 to 500 employees. This definition has caused some confusion; so to clarify things we now say Global 10,000 rather than Global 2000.

In large companies, the application we must integrate with is a custom application. However, the large company has the money to pay for the custom integration. There are also few large companies.

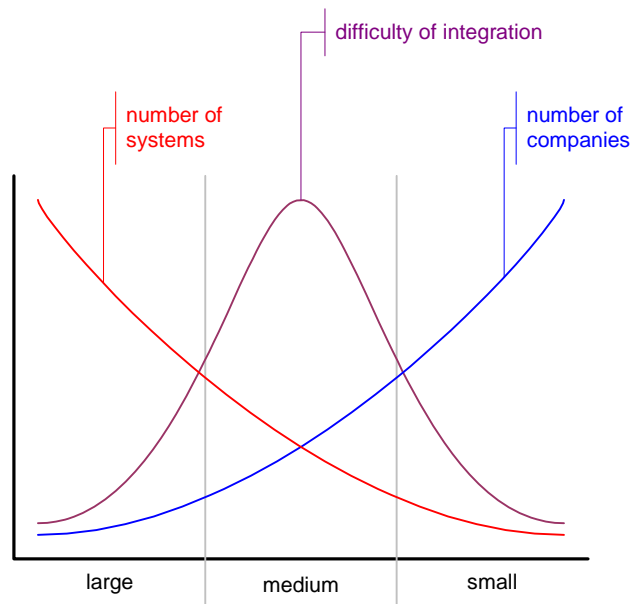
There are hundreds of thousands if not millions of small companies. However, they almost all use the same software packages: either Intuit's QuickBooks or Peachtree Accounting.

The midsize companies are a challenge. There are many of them. There are a good half-dozen leading applications used in any particular industry, with different

applications in different industries. For instance, there are five leading packages for the construction industry and five completely different applications leading in the light manufacturing industry. Although custom applications are rare in the midsize market, the companies have modified or customized their off-the-shelf applications just enough to make integration not a straightforward effort. Finally, midsize companies don't have the cash for large integration efforts.

I feel very confident about the large companies.

With the midsize companies we need to contact the midsize accounting package vendors. A list of these vendors is available at the frxsoftware.com partnership site. We might very well work with FRx Software to reach these vendors.



**Figure 23 The difficulty of integrating small, medium and large companies compared**

Along with the accounting package, there are also specialty applications used within markets. The one that leaps most readily to mind is the order entry system. Each industry sector has about a half dozen companies that sell these products. We will need to go on a case-by-case basis. The idea is that they do the systems integration for their client base for us so that we don't have to.

| Size   | Strategy       | Potential partners                          |
|--------|----------------|---|
| Large  | Own it         | IBM, Sun, Compuware, Big 5 consulting firms |
| Medium | Partner for it | FRx, midsize accounting software vendors    |
| Small  | Give it away   | AOL, Intuit, Peachtree                      |

**Table 3 Fundamental strategy**

From what I have seen in these midsize markets, the companies buy the software, install and train once and then they stay put. They don't keep maintenance contracts because they don't want to upgrade. It is too expensive for them to keep up-to-date, not just the dollars but also in the human resources toll for training. The clerk (there may be only one) learns how to use a single version of a single application and they stick to it. Thus, applications in midsize companies still run on FoxPro and Paradox.

## Industry

Most start-ups do not go after seven verticals simultaneously. The only way we can have enough depth to do so is through partnerships.

Within each vertical, we gain a distinct advantage by participating within their particular industry consortium. We need only look at our success with AIA to see this. Now realize that AIA may be the exceptionally forward thinker, we have no way of knowing until we are in with AIAG, etc. The AIA has written a letter of introduction to the AIAG and other organizations for us. At the very least, we should be inside the organizations to know what they are thinking and where they are going.

To date we have not dedicated resources for managing our relationship with industry organizations.

## Product mix

No company, not even Microsoft and IBM, can do everything. There comes a point where you have to say, “We have to let someone else do that.”

| Capability             | Primary partner | Secondary partners |
|------------------------|-----------------|--------------------|
| Communication          | Cyclone         | BTrade, Ipnet      |
| Workflow               | Handysoft       |                    |
| Flat file translation  | Unidex          |                    |
| Security               | Cryptek         |                    |
| Business intelligence  |                 |                    |
| Legacy data extraction |                 |                    |
| Legacy data movement   |                 |                    |
| Forms                  | PureEdge        |                    |

**Table 4 Partners mapped to product mix**

### Deciding on product mix partners

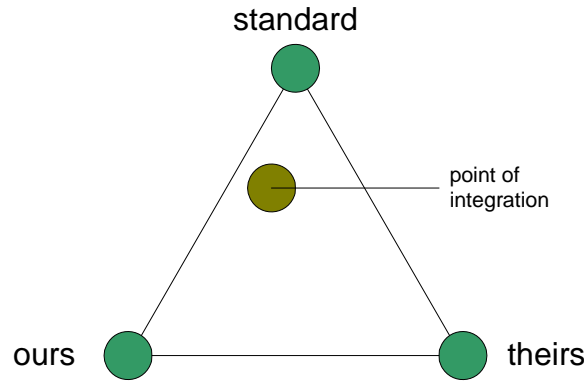
There are three points of decision for product mix partners: capability, integration and willingness.

- First, the product must have the capabilities we are looking for. This decision is owned by Marketing.
- Second, we must be able to integrate the partner’s product with our own. This decision is owned by Development.
- Third, the partner must be willing to work with us. Business Development owns this third decision.

There can be no effective partnership with all three points of decision being met.

### Integrating with product mix partners

Integration with product mix partners requires that we make changes to our software. The amount of change can vary greatly. At one extreme, we make no changes and the partner implements our interfaces. At another extreme, the partner makes no changes and we implement their interfaces. Invariably, there is also a standard interface. A third extreme is that both the partner and we implement the standard interface.



**Figure 24 Three points of integration**

With each primary partnership, we will negotiate a point of integration that is somewhere between our existing interface, their existing interface and the standard interface. All secondary partnerships will have to integrate to this point unless a business case can justify otherwise.

## Product stack

The product stack refers to the N-tier architecture that is inherent to any internet-base application. We don't build application servers, we don't build web browsers, and we don't build data storage servers. These are all infrastructure that we assume.

| Level              | Primary partner | Secondary partners |
|--------------------|-----------------|--------------------|
| Operation system   | Sun             | Linux, Microsoft   |
| Data store         | Oracle          | Sybase             |
| Application server | BEA             | Bluestone          |
| Queue              | BEA             |                    |
| Web services       | Cocoon          |                    |
| Web server         | BEA             | Apache             |

**Table 5 Potential partners mapped to product stack**

It is important that we sign up for development partnerships with our product stack partners.

## Channels

Business Development may pursue partnerships that serve as revenue generating sales channels. If these partners are software companies, then they should OEM our core technology, which is transformation, and not our entire product. They should be companies that provide strategic visibility and credibility in the market, such as Sun Microsystems and Cisco, and not potential equals and competitors. We should OEM our entire solution.

Partners that are product stack partners and product mix partners can also serve as channel partners.

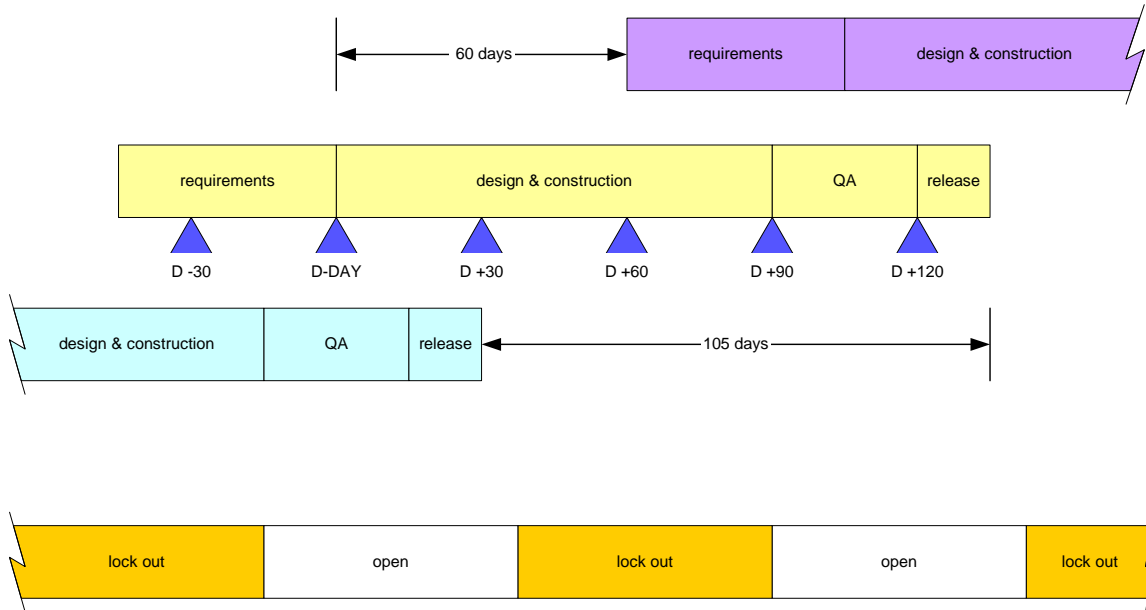
Any modifications to our software for a channel partner must come with a business case. Business development must justify that there is a significant and guaranteed

return on investment for the expenditure of our development resources on a channel partner.

# Development process

*Quality processes produce quality products.*

## Develop cycles



## Rigorous specification

The development process is a part of the product development process. I have used IDEF0 to specify the process. For those of you who are not familiar, IDEF0 is a graphical semantic developed by the United States Air Force to describe complex systems. It is comprised of an assembly of nodes typical of the one shown in Figure 25.

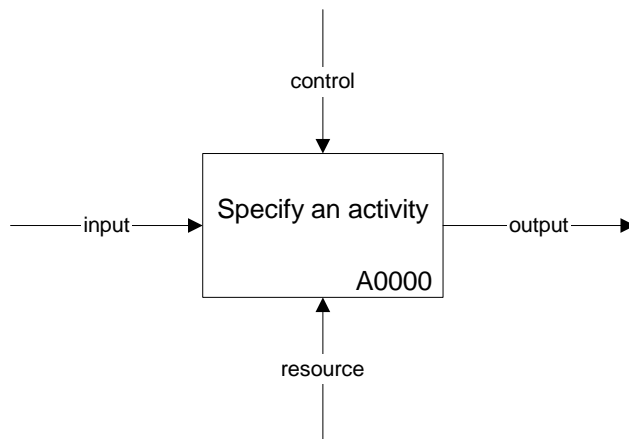


Figure 25 IDEF0 node

In IDEF0, the arcs (arrows) are nouns and the nodes (boxes) are activities. The label on the node must be a verb phrase. The node number in the lower right hand corner allows nodes to nest. For instance, node A21 is a child of node A2.

The details of a node are shown in a separate diagram. Thus Figure 27 Build products is a detail or drill down of Figure 26 Develop products.

Each diagram should have no less than 3 and no more than 7 nodes.

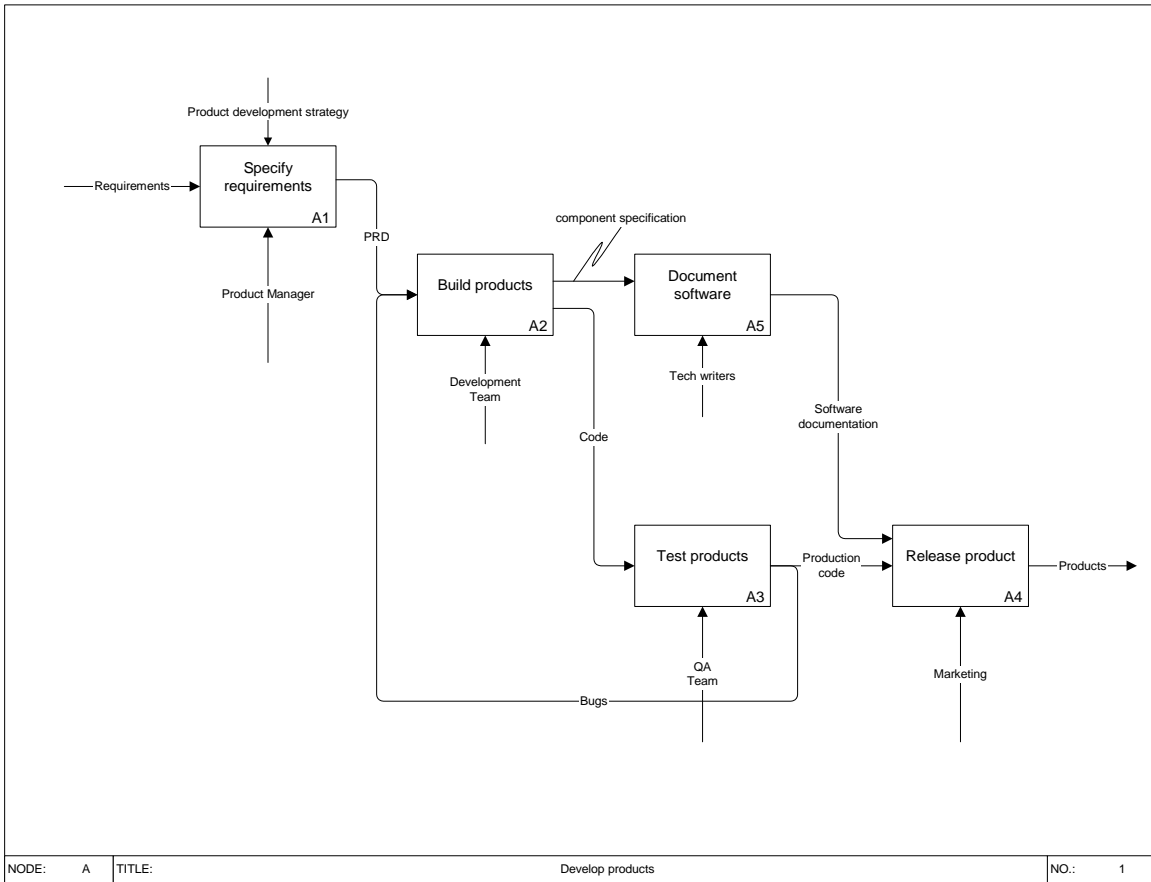


Figure 26 Develop products

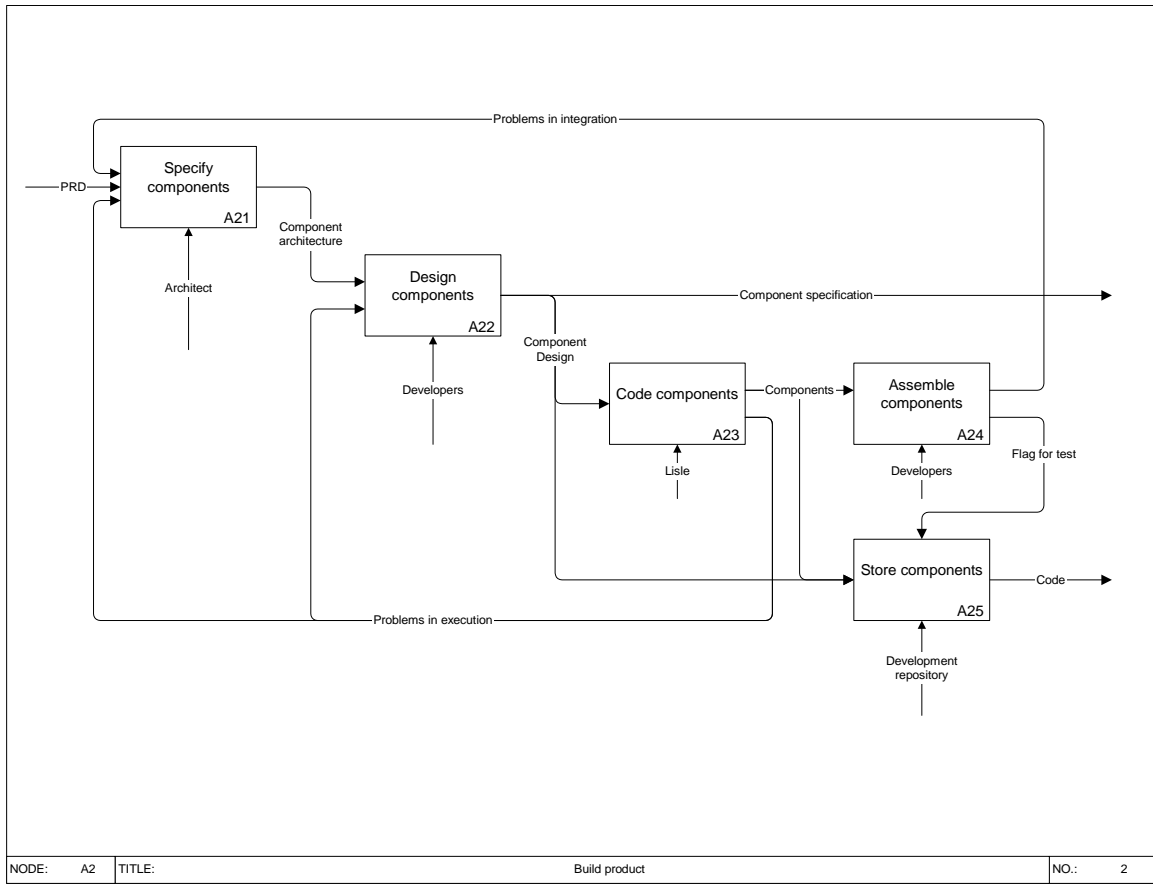


Figure 27 Build products

## Reference

- Cavinato, Joseph L. and Ralph G. Kaufman. *The Purchasing Handbook: A guide for the purchasing and supply professional*, 6<sup>th</sup> ed. McGraw-Hill: 2000. National Association of Purchasing Management.
- Fogarty, Donald W., John H. Blackstone & Thomas R. Hoffmann. *Production and Inventory Management*, 2d ed. South-Western Publishing Company, 1991. Published in conjunction with the American Production and Inventory Control Society.
- Supply Chain Operations Reference Model: Level 1 and Level 2 Reference Guide*. Supply Chain Council, Aug 1997.
- Woods, John A., ed. *The Purchasing and Supply Yearbook*, 2000 edition. McGraw-Hill, 2000. National Association of Purchasing Management.