

CORPORATE INTERNET STRATEGIES™

INCREASING BUSINESS VALUE THROUGH THE INTERNET & WORLD WIDE WEB FROM CUTTER INFORMATION CORP.

E-COMMERCE TOOLS: PART II — STOREFRONTS

by Carl Argila

We bottom feeders in the information technology field have our work cut out for us. Whether it's by hook, by crook, or by sheer blind luck, we have to see the next technological bandwagon coming and jump on it (or get run over by it!). And what separates the bottom feeders from the surface floaters? How accurately we can predict when that next bandwagon will arrive and what tune it will be playing.

One technique we use to hear what's coming is to keep our ears to the "cyber-ground," and one way to do that is to listen to industry "buzzwords" — who's using them and how frequently we hear them.

I mention this because some research I did recently for *CIS's* sister publication *Application Development Strategies* should be of interest to *CIS* readers. I searched the CompDB database, a commercial database containing over 750,000 industry-related articles, to see how many articles contained certain industry buzzwords. Figure 1 charts the number of times these words have appeared over the past five years.

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Here are some of the results:

- A perennial silver bullet, "object-orientation" (OO) was surpassed in late 1996 by "year 2000." In fact, over the five-year survey period, interest in OO has declined steadily, and dramatically.
- Interest in "year 2000," on the other hand, is growing exponentially. But look at "electronic commerce" — it has even overtaken "year 2000," and projections are even higher.
- I also plotted on the chart the use of industry trite-isms "silver bullet" and "software crisis." Use of the term "software crisis" jumped by a factor of 10 from 1996 to 1997 — and seems to be related to concern about the year 2000.

My guess is that although "year 2000" will surpass "electronic commerce" for the next two or three years as the millenium draws to a close, e-commerce *is* the future.

Well, most of you probably didn't need a crystal ball to tell you that, or a chart for that matter, even if it's nice to see the numbers. So here's my point: electronic commerce should see even greater growth once the IT industry gets the year-2000 crisis under control; and given the typical 18 to 24 month learning curve for any new technology, it is clearly an opportune time to start introducing that technology into most application development organizations.

One of the points that I made last month is that development tools cannot be evaluated, selected, or deployed outside of the context of an engineering or development process and method — now is the time to start evolving that process and introducing those methods.

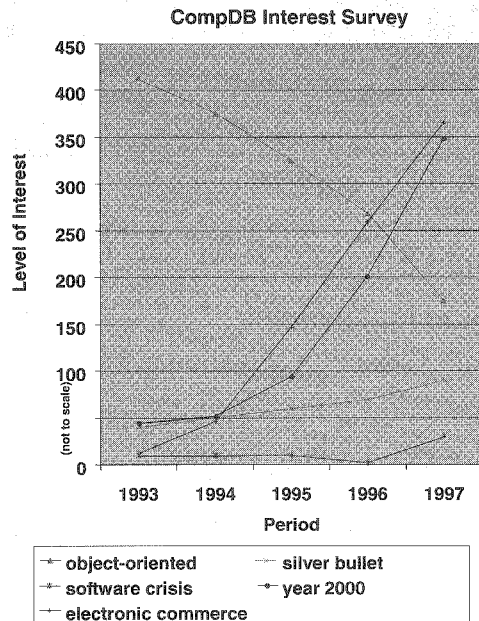


Figure 1: Level of Interest in Various Topics, As Evidenced by the CompDB Database

Another point is this: most of the big players in the tool development field are currently in a frenzy devouring profits from year-2000 tools; they haven't had an opportunity to focus seriously on e-commerce. All of that will change by 2001 or 2002, and I expect to see enormous growth in the e-commerce tools industry — growth that will dwarf what we saw in 1988-1992 in the CASE tools industry.

This issue of *CIS* is the second in a two-part series on e-commerce tools. Last month I focused on e-commerce tools from a general perspective. In spite of platitudes and admonitions about how tools must be part of a process and method, I didn't spend much time on these areas because the breadth of the e-commerce tools field did not allow it.

This month I want to focus on one particular segment of the e-commerce tools market: storefront products. I'd also like to explore further how process

and method are important considerations when evaluating and selecting e-commerce tools.

Key Points: Looking Ahead

- ◆ The writing's on the wall — electronic commerce is experiencing enormous growth, and that growth will explode after the year 2000.
- ◆ The next two years provide forward-thinking companies with a unique opportunity to migrate into e-commerce "the right way."
- ◆ Companies that take advantage of this opportunity will be repaid 1,000-fold in reduced maintenance costs, faster deployment, and so on.

Storefront Tools

A storefront is a special-purpose, Internet-based, electronic commerce application. It allows users to obtain information about products for sale, assemble selections of products to buy, and execute transactions to purchase and acquire those products. It also provides other ancillary and administrative functions related to product sale and maintenance. Typically, a storefront incorporates a GUI with various visual metaphors such as facades, shopping carts, rooms, and departments.

In fact, nothing about this is new. It's what we've been doing, more or less, since Charles Babbage thought up a new way to compute navigational tables. Recently, it's what we've been doing with visual development tools like PowerBuilder and Visual Basic.

The difference with storefront tools (I critique some later in this issue) is that almost none of the vendors seem to have learned any lessons from their experiences with visual development tools. For example, in most cases, OO development and integration with analysis tools are virtually nonexistent.

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What this suggests to me is that most of these storefront applications will be developed with ad-hoc analysis and design techniques.

I can reach a similar conclusion from a different direction. In a manner similar to the way I measured occurrences of industry buzzwords in Figure 1, I surveyed Usenet message postings on the Deja News Web site (www.dejanews.com) for mentions of certain terms. The first words I searched for were "storefront development." The Deja News "confidence rating" for exact matches showed only four groups where the words appeared in message postings, all of equal rank:

Group	Confidence
alt.internet.commerce	99%
aol.commerce.misc.ads	99%
aol.commerce.mlm.discussion	99%
rec.antiques	99%

The first three groups are computer-related, but not a single technical group came up in the search.

I limited my second search to just the term "storefront." This time I got two full pages of Usenet newsgroups that referenced "storefront." However, only six had a 50% or greater confidence rating for exact matches:

Group	Confidence
alt.business.misc	99%
alt.music.ska	83%
alt.religion.scientology	68%
misc.jobs.offered	66%
alt.business	64%
alt.internet.commerce	53%

The first clearly Internet-related group is sixth — lagging far behind Scientology! To sum up my findings, I didn't come across any technical groups with confidence levels above 9%, trailing behind such Usenet groups as alt.tv.x-files.creative. And, to top it all off, I found *not one single occurrence* of the words "storefront development tools."

This does not bode well for the future. It suggests to me two things:

1. The software development tools industry is not exactly "a-buzz" with talk about storefront development, yet few of these people would doubt that e-commerce is the future and the storefront can be the doorway to e-commerce.
2. I predict that we will see horrendous maintenance problems when today's storefront becomes tomorrow's legacy application. And the seeds for those legacy nightmares are already being planted.

Key Points: Storefront Tools

- ◆ Developers of the current crop of storefront development tools seem to have learned little, if anything, from the recent decade of visual development tools.
- ◆ Support for reuse and integration of analysis tools is virtually nonexistent.
- ◆ The seeds for tomorrow's legacy nightmares are being planted today.

A Look at Today's Storefronts

While researching for this issue of *CIS*, I examined a number of successful commercial storefronts. My reasoning was that these large corporations have the resources to develop top-of-the-line storefronts, and these storefronts should reflect the industry today. I found the "Let's Go Shopping" section of *PC Magazine* to be very helpful.

I looked at companies such as Macy's, Eddie Bauer, CompUSA, and Barnes and Noble, and finally decided to focus on the storefront of 1-800-FLOWERS (www.1800flowers.com). I selected this site for a number of reasons: my lifestyle and personal preferences keep me away from shopping malls — I now do virtually 100% of my gift-shopping on the Internet — and I'm a frequent customer of FTD (www.ftd.com), which will give me a reference point for discussing 1-800-FLOWERS.

As I moved through the 1-800-FLOWERS site, I noted various aspects of analysis and design. My intention was to use these observations to compile a



Figure 2: The 1-800-FLOWERS Web Site

list of criteria, which I could then use to evaluate different storefront tools.

In my ideal shopping scenario, I want get all of my gift-giving obligations out of the way as quickly as possible using the minimum number of key-strokes and mouse-clicks. Therefore, I'd prefer to do all of my shopping on a single site, and a look at the 1-800-FLOWERS site suggests that this might be possible (see Figure 2).

I should also mention that, like many people, I have a fairly low tolerance for useless navigation around a site — if I can't enter a site, make my selection, and purchase my goods within about 7 ± 2 steps, I'm probably going to take my business elsewhere. But there's another reason to apply something like a " 7 ± 2 " rule: "human factors."

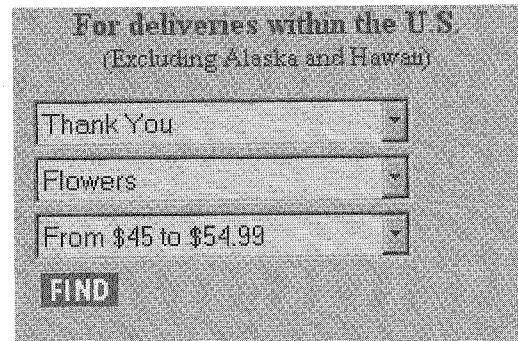
When navigating around a storefront, the shopper is building a mental model of that site. George A. Miller's seminal research on short-term memory suggests that after about 7 ± 2 jumps, the shopper may be so confused that he or she will simply give up in frustration and perhaps go somewhere else. Also, every machine cycle counts for a high-volume site, so efficiency is important.

An important consideration then, when evaluating a tool, is whether it allows you to create an overall "user interface topology," which lets you "play through" different shopping scenarios before expending the time and energy to build an actual storefront.

So, first in my list of criteria, is this:

A storefront development tool should have some mechanism by which the overall structure of the shopper's interface can be modeled, without having to prototype actual storefronts.

Let's say that I've just completed a major project and want to send some flowers to a few people who were particularly helpful. I go to the 1-800-FLOWERS site (Figure 2) and make the following selections:



I select "find" and wait — and then I see the following message:

No products found that matching your selections.
Try broadening your search or selecting another price range.

Oh, no — a dead end! I have two comments to make here: one process-related and one is tool-related.

1. I know absolutely nothing about how 1-800-FLOWERS develops its software, but based on the grammar error in the above message, I have concerns about their process. The error should have been caught during some type of a review or quality assurance process.
2. And a dead end? Unforgivable! Remember, they've got only 7 ± 2 steps before I give up and go back to www.ftd.com.

In my opinion, instead of a "dead end," the storefront should have displayed an advisory message that said something like: "Sorry, we have nothing in that price range, but here's what we do have...."

Second in my list of criteria then, is this:

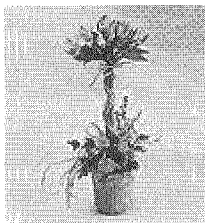
A storefront development tool should have some analysis facility that identifies "dead ends," recursive or circular paths, and nonreachable paths.

After backing up to the 1-800-FLOWERS home page, I change my price range to "any" and am given a choice of four products. One of these, "Spring Inspiration," has a \$44.99 option — only \$0.01 less than the \$45 minimum I had originally requested! I decide instead to go with the "Floral Topiary," which is also on the list and is considerably cheaper at \$24.99.

Floral Topiary

Price - \$24.99,
\$29.99, \$34.99

Same Day Delivery
On All Orders Placed by
2:00



Click to BUY

Had the 1-800-FLOWERS storefront originally presented me with the \$44.99 product, I might never have even known about the \$24.99 product.

So a third criterion is:

A storefront development tool should provide some facility for conducting "what-if" scenarios, or should provide some facility that allows a proposed storefront design to be subjected to a review and evaluation.

Now I'm ready to make my selection. I click on "click to buy" and see the following:

Small	\$24.99	<input type="text" value="1"/>	<input type="button" value="Add"/>
Medium	\$29.99	<input type="text" value="1"/>	<input type="button" value="Add"/>
Large	\$34.99	<input type="text" value="1"/>	<input type="button" value="Add"/>

Since I'm in a hurry and I want to just get this done, I decide that I'm going to send the same type of gift to everyone on my list. But I do want to

send different sizes to different people, so I select one of each size. But which "add" do I click on? After trying out several different alternatives, it seems that I need to order one size, then come back and order the second size, then come back and order the third size. This is very confusing to me, and very time-consuming. A single "add" button would have worked nicely. This experience reinforces my conclusion that a storefront development tool should allow exploration of various "what-if" scenarios to uncover problems like this in advance.

I eventually fill up my "shopping basket" with one Floral Topiary of each size and decide I'm ready to pay and leave. My shopping basket looks like this:

You have 3 items in your shopping basket:

Product Code	Qty	Country	Description	Price	Service Charge	Total	
1324	<input type="text" value="1"/>	US	Floral Topiary	\$24.99	\$5.99	\$30.98	<input type="button" value="Delete Item"/>
1324	<input type="text" value="1"/>	US	Floral Topiary	\$29.99	\$5.99	\$35.98	<input type="button" value="Delete Item"/>
1324	<input type="text" value="1"/>	US	Floral Topiary	\$34.99	\$5.99	\$40.98	<input type="button" value="Delete Item"/>
Order Total:						\$107.94	

To change an item's quantity, edit the number and press

Before I can specify my three recipients (all in different locations), the storefront requires that I give my credit card information:

Type:

Expiration Date:

Date: NOTE: Sears charge card will ignore the expiration date

Single All the items in my Shopping Basket are being delivered to the SAME ADDRESS

Multiple The items in my Shopping Basket are being delivered to MULTIPLE ADDRESSES.

It doesn't appeal to me that I must choose different paths depending on whether I have a single recipient or multiple recipients, but that may be just an aesthetic preference on my part, and tools won't help with that. So skipping ahead a few steps, I specify my three recipients and I'm ready to check out.

But wait! While in the checkout process, I remember that my mother's birthday is next month. Since I can specify a delivery date, why not get Mom a dozen red roses while I'm here? I click on "return to list" and grab my roses. However, when I try to continue with my checkout, I get the following message:

Please fill out the missing information

We are sorry, but we are unable to process your request:

- credit card number must be a string between 13 and 19 characters

To fix this error, please return to the [checkout form](#).

My credit card information is gone and I have to restart my checkout procedure. I give up!

This inability to allow me to "checkout shop" can be illustrated with an analysis tool: the state transition diagram. As the 1-800-FLOWERS storefront is currently designed, a "session" may be in any one of five principal states (see Figure 3). The various transitions between these states represent links and transactions that may be traversed or executed, respectively, within a given session. State transitions

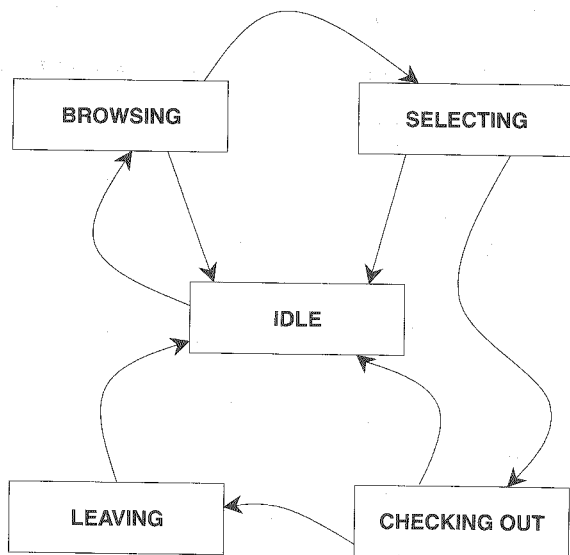


Figure 3: State Transition Diagram for 1-800-FLOWERS Site As Currently Designed

are associated with events such as "user selects product" and "order form submitted."

The 1-800-FLOWERS storefront could be enhanced with the addition of a sixth state, "checkout shopping," as shown in Figure 4. A customer could now pick up a last-minute gift, and this feature could even be used for promotional purposes: for example, "Dear Shopper, we have a 'blue light' special on candy — would you like to ship a box with those roses?"

In fact, having a formal analysis and design model would greatly enhance the ability to maintain and upgrade the 1-800-FLOWERS storefront. But how would changes to analysis and design models be propagated to the storefront implementation? The current crop of tools provides no mechanism to link analysis and design models with implementation.

My fourth criterion then, is this:

A storefront development tool should provide some facility for interfacing with analysis and design tools, and propagating analysis and design information to the storefront implementation.

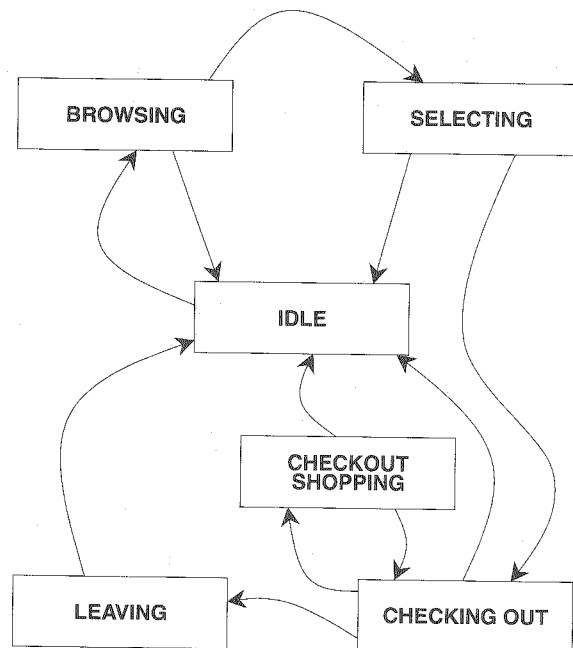


Figure 4: State Transition Diagram for 1-800-FLOWERS Site with Modification

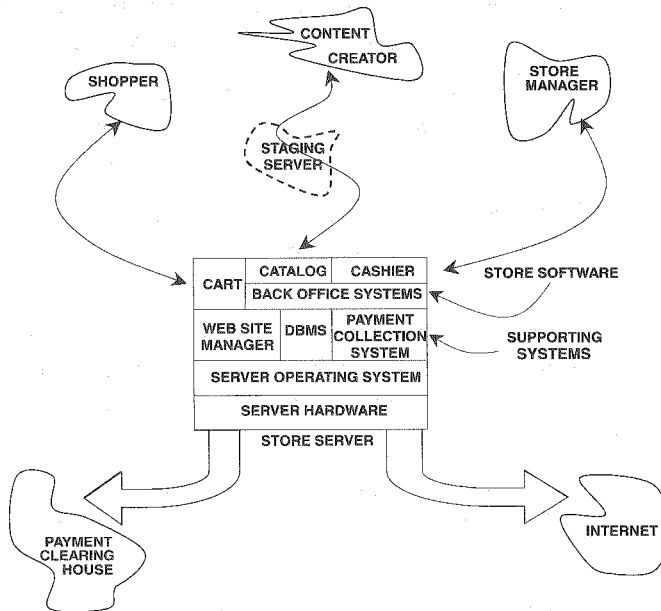


Figure 5: A Conceptual Diagram for Evaluating a Storefront Tool

I hope this walk-through of a storefront and the criteria I've included have given you some insight into what you might want to look for in a storefront development tool. In the remainder of this issue, I'll identify some more concrete and detailed criteria for evaluating storefront products, but the expectations derived from this section are no less important than, say, expecting a product to be ODB-compliant.

Key Points: Storefront Walk-Through

- ◆ Today's typical Internet storefront has a *long way* to go before it will appeal to the mainstream consumer.
- ◆ There are a number of areas in the analysis, design, and implementation of storefront software where usability could be enhanced with good development tools.

Evaluating Storefront Products

One skill that should be included in the software engineering curriculum is *how* to evaluate software engineering products. Most of us do a better job evaluating which household appliance to buy than which database! In this section I'll discuss evaluating software engineering tools within the context of evaluating storefront products.

One of the first things I do *before* evaluating any software engineering product is create a "conceptual diagram" that depicts the product I'll be evaluating within the context of a bigger system, process, or environment. A conceptual diagram should be independent of any specific product, but may capture different strategies for the type of product being evaluated. In the latter case, I would create multiple conceptual diagrams, each representing a different strategy. In Figure 5 I've created a conceptual diagram for storefront tools.

Many readers are probably too young to remember IPO diagrams, but frequently these conceptual diagrams have this kind of input-process-output structure. In the case of storefront tools, inputs (at the top of the diagram) are provided by shoppers, content creators, and store managers. (The bidirectional arrows indicate that responses may be elicited by these inputs.) Related server systems are in the center of the diagram. I've illustrated here that storefront systems must interface and/or integrate with other server-based systems. Finally, the ultimate output of a storefront system is communication with other remote systems via the Internet, and what I've called a "payment clearing house," which may or may not be accessed via the Internet.

Having created a conceptual diagram, let's now examine the diagram to identify characteristics of the product as well as the other systems, processes, or environments that are within the context of the system. I'll examine each of these in turn and point out features to look for and questions to ask.

Shopper

- The shopper will always access the storefront via a browser, so look for products that support open standards.
- Avoid products that specifically identify browser compatibility by brand name.
- Avoid browsers that rely heavily on client-based components (e.g., applets).
- A good test is whether the storefront will work with a text-based browser.

- More sophisticated stores will have various personalization features. How will you support those features?

Content Creator

- Look for products that support browser-based content creation.
- How will new store content be previewed? I consider it unacceptable to install content on a "live" store, so it's a good idea to look for some kind of a staging facility.
- Some products will support a "staging server" — this may be good, but make sure that a staging server isn't mandatory.

Store Manager

- Look for products that support *mostly* browser-based management and maintenance.
- Evaluate management facilities vis-à-vis real store operating facilities: How would out-of-stock items be removed from the "shelves" immediately? How would you handle price changes? If you change a price while the product is in a customer's shopping cart, what do you charge the customer at checkout?
- How is management access restricted to various levels of managers?
- Does the product require that the store be "closed" (offline) for maintenance?

Catalog

- Every storefront product will have facilities for maintaining inventory — a catalog. Some niche products do nothing but manage a store catalog.
- Since the shopper will most likely interface with the catalog, the same caveat for browsers should apply for catalogs.
- How are catalogs entered and maintained?
- How can existing product information be imported into a catalog? Look for DBMS and/or spreadsheet interface facilities.
- How are sales and limited inventory items maintained?

- Does the product require maintenance of multiple databases? If so, how are they synchronized?
- Does the product interface with an existing inventory management database? If so, how are updates communicated — in both directions?
- Does the product require that the store be "closed" (offline) for inventory updating?

Cart

- All products will have some facility for selecting products from inventory — this is usually called a "cart." Some niche products are solely cart facilities.
- Some cart facilities may be hosted on the store server; others may be hosted via links to commercial cart services.
- Since carts will interface with the shopper, the same caveats about browsers should apply for carts.
- Look for special cart features, such as personalization, "up-selling," and "persistence" (the capability to "park" the cart while the shopper leaves to return later).

Cashier

- The checkout facility will typically interface with a commercial payment processing system.
- If you intend to manage multiple stores (a mall), different stores may require interfaces with different payment facilities.
- Expect the cashier to automatically calculate applicable taxes and shipping charges.
- Look for support for SSL (secure sockets layer) processing.

Back Office Systems

- This is the area where high-end products are typically distinguished from low-end products.
- Storefront products may offer or support a plethora of back office features. These features include inventory management, buyer-list management, and various forms of market analyses and reporting.

- Look for back office features that support your *current* business processes — it won't be of much benefit to you to have sophisticated back office features that you never use.
- One back office feature you *can't* live without is automatic out-of-stock notification.

Web Site Manager

- All storefront products must interface with a Web server. Beware of claims that a given product will "work with any Web server."
- Inevitably, you will need to customize your store. This will most likely require the use of a scripting language such as JavaScript or VBScript.
- Avoid products that use proprietary scripting languages such as iCat's Carbo or Merchant Builder's Site Magic eXtensions (SMX). I would also avoid products that require the use of WebC, which is no longer widely used.

DBMS

- All storefront products must interface with a database, and most likely that will be some type of a DBMS. Look for open standards such as ODBC, and look for vendor-supplied drivers for SQL or DB2.
- You should be able to create your own customized reports with third-party packages such as Crystal Reports.
- The DBMS facilities of the storefront product will prove to be its Achilles' heel when the storefront becomes a legacy system. Investigate carefully how well the storefront product can import and export data to and from your DBMS.

Server Operating System

- Look for compatibility and portability in the operating system or systems supported by the storefront product. You *will* move your store between various servers and possibly various service providers. Purchasing a storefront that operates only under VAX/VMS may significantly limit your options in the future.
- The safe bets on systems support are, of course, Windows NT and virtually any flavor of Unix.

This is also an important consideration if you choose to have your storefront hosted by an ISP.

Product Critiques

In this section, I'd like to give you an idea of what the storefront tools market is like as it exists today. For Part I of this series (see *CIS*, January 1988), I searched thousands of software development company Web sites using search terms related to electronic commerce and commerce on the Internet. I then narrowed down that list by searching for companies that specifically identify "e-commerce development" or "support tools" as part of their business. Along the same lines, for this month's *CIS*, I extracted from that list companies that specifically identified "storefront tools" or related products or services. The result is a list of 33 products — I will critique each of these products here.

There are some caveats I should mention before I begin. *All* of this information was gathered from Web sites, including vendor sites, and therefore discrepancies may exist. I've tried my best to resolve any discrepancies, but you should contact the vendor directly for the latest and, presumably, most accurate information available. The evaluations appear alphabetically by product name, and I've indicated what I believe to be the most current product version where available, stated, or relevant. Specific platform information can become very detailed, so I included only platform "flavor." I indicated pricing information when I could get that information from either the vendor's site or other published sources (see references on page 16). Enjoy!

Cartalog 4.0
Virtual Spin
www.virtualspin.com

Cartalog is a browser-based, turnkey e-commerce service. Marketing and reseller programs are available to developers and ISPs, and the company also provides merchant services.

Platform: N/A.

Pricing: Cost is \$50 per month for up to 150 SKUs (other pricing options are also available).

Cat@log 2.0
The Vision Factory, Inc.
www.thevisionfactory.com

Cat@log is a suite of products that supports storefront design, implementation, and management. Cat@log Builder is a Windows 95- and NT-based design tool. It uses an open architecture providing server-side support for ISAPI and CGI. This is *not* a design tool for novices — it provides a development environment for complete storefront design. The product does not include an HTML authoring tool, so you need to use your own, but I consider this aspect to be consistent with an open environment. Cat@log Manager is the server-based software and will interface with any ODBC database; Cat@log Commerce includes shopping baskets and provides interfaces with external payment systems.

Platforms: Runs on Windows 95 and NT.

Pricing: Cost for Cat@log Builder is \$4,995.

Commerce Suite 2.5
(Version 3.0 to be released in early 1998)
Inex Corporation
www.inex.com

Inex provides two applications: Commerce Court and Commerce Court for Site Server. Both applications have client and host components. The Commerce Court products are tightly integrated with Microsoft's Site Server, and are therefore not truly open solutions. Both products provide the facilities for building a Web storefront, creating and managing a database, and maintaining security, among other features. In addition, Inex has a fully functional accounting package available.

Platforms: Runs on Windows 95 and NT.

Pricing: Cost for Commerce Court for Site Server is \$995 for the entrepreneur edition, and \$4,995 for the professional edition.

Domino.Merchant 2.0 Server Pack
Lotus Development Corp.
www.net.lotus.com

SiteCreator 2.0 is a template-driven wizard for site creation and management. It includes Web site application templates for storefronts, order processing, cataloging, and other components. Another component, Lotus Domino 4.6 Server, is part of IBM's Network Computing Framework. The Domino.Merchant component (an extension of the

Lotus Notes environment) is ideal for customers with an existing Notes infrastructure. Browser-based setup is easy using the existing templates, and functionalities such as workflow, security features, and approval processes are provided by Domino Server. Domino.Merchant supports a "separation of concerns" paradigm, in that site generation is functionally distinct from site maintenance. Installation of these products in a non-Notes environment, however, is more difficult and requires Domino 4.6 Server.

Platform: Runs on Windows NT and requires Domino 4.6 Server.

Pricing: Estimated cost is \$3,495 for a single server, and includes five total client software and licenses.

EC Store
Quinn Communications, L.C.
www.quinncom.net

This is a leased, dedicated EC server hosted by Quinn Communications.

Platform: Runs on Windows NT.

Pricing: Cost is \$499 per month, based on a lease value of \$33,962.

GO-CART 3.0
GO International, Inc.
www.go-cart.com

GO-CART is an automated order entry and secure payment verification subscription service. GO-CART can be added to any new or existing online catalog, and acts as a link from the storefront's current host site directly to GO International's GO-CART servers. Servers provide 24-hour access to real-time order entry and credit card authorization services. Alternatively, the entire storefront can be hosted by GO International's GO-SHOP Merchant Services Division in the GO-SHOP International Online Mall. The GO-CART Shopping Cart System component provides order processing and payment collection services.

Platform: N/A.

Pricing: There are various cost options, starting from \$150 for setup and \$50 per month.

GoldPaint Shopping Cart
GoldPaint Professional E-commerce Systems
www.goldpaint.com

GoldPaint is a shopping cart system. It also has the capability to create Web pages based on database files, but requires the use of its proprietary GoldPaint language, and I do not recommend products that use proprietary technologies. Since the GoldPaint software is written in the C programming language, the vendor claims that it will "run on any server."

Platform: N/A.

Pricing: Cost starts from \$990.

iCat Electronic Commerce Suite 3.0
iCat Corporation
www.icat.com

Although iCat's Electronic Commerce Suite offers many good features, it uses a proprietary scripting language, the iCat Carbo Command Language (ICL), for customization rather than an open language such as JavaScript and VBScript. The program uses the server-based iCat Carbo engine that interfaces with the database and dynamically creates all HTML pages. Knowledge of SQL programming is a must for using this tool. The suite includes database support tools, remote site administration (using a Web browser), a robust set of templates that support various payment processing systems, and reporting functions. The Electronic Commerce Publisher 3.0 creates catalogs, enters data, manages templates, etc.

Platforms: Runs on Windows 95 and NT; Unix.

Pricing: Cost is \$9,995 for the professional edition, and \$3,495 for the standard edition (available for Windows NT only).

Internet Business Breakthrough
Breakthrough Software, Inc.
www.breakthroughsoftware.com

This is an entry-level product targeted toward small to medium-sized business. It includes an assortment of design templates and various other tools. Data can be imported from any ODBC-compliant database. Unfortunately, customization requires knowledge of WebC, a scripting language that is not as popular as JavaScript or VBScript. I found the vendor's information about hosting requirements to be sparse.

Platforms: Runs on Windows 95 and NT (server requirements not available).

Pricing: Cost is \$249.

Internet Creator 4.0
Forman Interactive Corp.
www.forman.com

An entry-level product geared toward small to medium-sized businesses. A number of wizards support creation of the storefront. Forman also provides publishing and hosting services.

Platforms: Windows 95 and NT.

Pricing: Cost is \$149, and \$29 per month for hosting.

Internet MallManager 3.0/StoreManager 2.0
Outreach Communications Corp.
www.outreach.com

Internet MallManager and Internet StoreManager are merchant Web server software and optional PC client software packages, respectively. The Internet MallManager commerce Web server, operating stand-alone or in conjunction with its Internet StoreManager PC client, enables the various merchant functions. Outreach also offers a hosting service.

Platforms: Runs on Windows 95 and NT; Unix.

Pricing: N/A.

Intershop Online 2.0
Intershop Communications, Inc.
www.intershop.com

A mid-level product that provides a complete storefront solution. Intershop has good, open database support — Sybase SQL Server 11 is bundled with the product. Unlike a number of other products, an Inventory Manager tracks and logs all stock changes. The product also has useful back office features.

Platforms: Runs on Windows NT and Unix.

Pricing: Cost is \$4,995 for Windows NT, and \$7,995 for Unix (for a single store license).

Istore
Netscape Communications Corp.
www.netscape.com

IStore is Netscape's "cost-effective, entry-level software solution" for providing storefront facilities. The product does, however, require Netscape's Commerce Server and is "integrated" with Netscape's Credit Card Gateway. As with a number

of the low-end tools, IStore allows browser-based setup and management. I would recommend IStore only for those environments that have an existing Netscape infrastructure.

Platform: Runs on Unix.

Pricing: N/A.

Lemonade Stand
iCat Corporation
www.icat.com

iCat plans to introduce an entry-level product, "iCat Lemonade Stand," in the first quarter of 1998. Additional information was not available as this issue went to press. Contact the vendor for an update.

LiveCommerce
Open Market, Inc.
www.openmarket.com

LiveCommerce adds missing storefront features to Open Market's existing back-end transaction processing systems. LiveCommerce includes templates and utilities for building and managing a large catalog of products.

Platform: Runs on Windows NT.

Pricing: Cost is \$45,000 (list price).

Merchant Builder 2.1
The Internet Factory Inc.
www.ifact.com

Merchant Builder is a complete browser-based design and maintenance storefront development tool that will work with any ODBC database. Unfortunately, customization requires use of Internet Factory's Site Magic eXtensions (SMX — Server Macro Extensions), rather than the widely used JavaScript or VBScript. As I've said before, I do not recommend products that use proprietary technologies.

Platforms: Runs on Windows 95 and NT, and requires ISAPI- or NSAPI-compatible servers.

Pricing: Cost is \$1,495 for a single store license.

Merchant System
Actra/Netscape
www.netscape.com

As with other products in this genre, Merchant System is Netscape's short-term strategy for providing storefront facilities "that the Netscape Enterprise Server does not currently include." Merchant System includes a robust collection of shopping

features as well as reporting and maintenance facilities. Interestingly, Netscape sells its "staging server" product separately from the Merchant System "live server." As with the Net.Commerce and Site Server tools, buying into this tool means buying into the company.

Platforms: Runs on Windows NT and Unix.

Pricing: Cost is \$63,000 (list price, which includes Oracle 7.3).

MerchantWave
CommerceWAVE, Inc.
www.commercewave.com

A turnkey product, MerchantWave provides storefront tools and services for small to medium-sized businesses.

Platform: N/A.

Pricing: N/A.

Net.Commerce 2.0
IBM Corporation
www.ibm.com

As with Microsoft's Site Server and Netscape's Merchant System, purchasing IBM's Net.Commerce product means more than just buying a storefront development tool — it means committing to a company, its technology, and its vision of the future. Net.Commerce has a competitive set of commerce development features and also works with Netscape's Enterprise Commerce Server. Unfortunately, Net.Commerce's use of a proprietary format makes it difficult to import data from other databases. Net.Commerce supports DB2, but the only ODBC database supported is Oracle. I would recommend this product only for those shops that have an existing commitment to IBM technology.

Platforms: Runs on Windows NT and Unix.

Pricing: Cost is \$4,995.

One-To-One Commerce Server 1.6
BroadVision, Inc.
www.broadvision.com

This product is a high-end solution built on top of BroadVision's existing e-commerce products. One-To-One provides a competitive collection of features, and One-To-One Commerce Server has the ability to provide "dynamic personalization" for each shopper.

Platforms: Runs on Windows NT and Unix.

Pricing: Cost is \$40,000 (list price, per developer).

OrderPoint

Speedware Corporation, Inc.

www.speedware.com

OrderPoint is a complete Internet commerce application development, implementation, and management environment. It will appeal primarily to medium to large-scale enterprises, particularly those with a mainframe-based database legacy. Speedware OrderPoint is delivered with an ISAM database, but supposedly can be ported to other databases, including Oracle, Sybase, Informix, Allbase, and SQL/Server. The product also supports ODBC.

Platforms: Runs on Windows NT and Unix.

Pricing: Cost is \$15,000-\$40,000.

PeachLink

Peachtree Software

www.peachtree.com

As with other products of this genre, PeachLink is intended for use with a subscription service. Peachtree's PeachLink product is comparable to that of other entry-level storefront products targeted at small to medium-sized businesses. Its most significant difference, however, is its link to Peachtree's widely used Peachtree Complete Accounting product.

Platform: N/A.

Pricing: Cost is \$49.95, and includes 30 days of free hosting.

ShopSite 3.0

iCentral, Inc.

www.icentral.com

ShopSite software is an online store creation system for small to medium-sized businesses that allows merchants to build and maintain catalogs of products to sell on the Internet. The system includes tools for site creation and management, calculating sales and traffic statistics, securing encrypted transactions, and online order fulfillment. The standard edition of the product, ShopSite Manager, is targeted at smaller businesses with up to 2,000 products. The professional edition, ShopSite Pro, has the database facilities to support larger stores plus more tools.

Platform: Runs on Unix.

Pricing: Cost is \$495 for ShopSite Manager, and \$1,295 for ShopSite Pro.

Site Server 2.0

Microsoft Corporation

www.microsoft.com

As with IBM's Net.Commerce and Netscape's Merchant System, purchasing Microsoft's Site Server represents far more than just buying a storefront product for the user — it represents a commitment to a company, its technology, and its vision of the future. With this release of Site Server, Microsoft has added some new features and dropped some previously included add-ons (such as templates and a bundled database). The Enterprise Edition includes Commerce Server 2.0, Usage Analyst, Site Analyst, and Web Publishing Wizard. A strong feature of Site Server is its Order Processing Pipeline, which handles targeted functions such as taxes, shipping, and payment.

Platform: Runs on Windows NT.

Pricing: Cost is \$4,999.

SoftCart

Mercantec, Inc.

www.mercantec.com

SoftCart is the basic Mercantec store management (server) product. Additional products include SoftCart Store Builder for Microsoft FrontPage, the SoftCart Software Developers Kit (SDK), and FrontPage Design Templates for SoftCart. SoftCart Store Builder, together with FrontPage, provides basic storefront development capability. Store Builder contains a number of FrontPage extensions and templates. For customization, the SoftCart SDK includes sample programs (C and PERL) for the primary SoftCart interfaces.

Platforms: Runs on Windows 95 and NT.

Pricing: Cost for SoftCart is \$1,500 for a single store license; cost for Store Builder is \$99 (until 30 March 1998); the FrontPage Design Templates (by Mercantec) are free.

StoreFront
ShopSoft Corporation
www.shopsoft.com

Here's a mystery for you: This product, StoreFront, appeared in the results of my search for storefront tools. I accessed the vendor's Web site for more information, and found that it is active and states that StoreFront is "a comprehensive suite of tools for development and maintenance of online shopping systems." The product includes a catalog builder and a shopping cart system, which is a CGI application that submits orders to the merchant via e-mail. However, when I attempted to click through to the product page, I encountered a message reading: "Under construction — stay tuned!!!" dated 1996! There seems to be no further information available about this product and the vendor has not responded to my e-mail.

Storefront Solution
storefront.web.aol.com

Okay, here's my "grab bag" selection for this month. This Web site popped up on one of my searches. However, when I accessed the site, I couldn't find any affiliation for this product indicated on the site, other than an AOL "gimmecap." From what I can tell, my assumption is that the product is a service associated with the America Online subsidiary, Prime Host. My previous experiences and disappointments with America Online services make me leery of this product, but you can judge for yourself.

StoreFront Web Creator
Margmiðlun hf. (Iceland)
www.margmidlun.is

This product uses a wizard to guide the user through the storefront creation process. As with other tools in this class, this is strictly a storefront development tool and requires that an ISP install server files. The StoreFront Web Creator is the only product that I could readily identify as being of non-North American origin.

StoreSoft Version 1.1.3
Richards Consulting
www.storesoft.com

StoreSoft is a CGI program designed for installation on an existing Unix Web server. The product was written using the PERL language, so

enhancements should be fairly straightforward. StoreSoft's principal limitation is its database, which are text files. "There's no need for any commercial database software or database consultants ..." says the StoreSoft Web site. I would add, "... and there's no need for query facilities, reports, or data normalization." At any rate, the price is right: "StoreSoft is a free product to individuals and small unincorporated businesses. Incorporated businesses and those who wish to open more than one online market are asked to pay a \$60 license fee."

Platform: Runs on Unix.

Pricing: Cost is free or \$60, as described above.

Viaweb Store 4.0
Viaweb Corporation
www.viaweb.com

ViaWeb Store 4.0 (formerly Live Store 3.0) is a storefront hosting service. Sites are designed and administered with a Web browser. A complete set of tools is available, including link tracking, repeat customer detection, and mailing list manager. ViaWeb provides special sales features such as cross-selling and revenue sharing.

Platform: N/A.

Pricing: Flat-fee pricing, starting from \$100 per month for up to 50 items.

WebCart
Anacom Communications, Inc.
www.anacom.com

WebCart is a turnkey, storefront service. The product features browser-based access for design and maintenance, including database administration. Two store payment options are available: secure information capture and secure payment processing.

Platform: N/A.

Pricing: Cost is from \$530 for setup (including first two months) and \$70 per month.

WebSite Pro 2.1
O'Reilly and Associates
website.ora.com

WebSite Pro is a full suite of Web site server tools and includes a number of commerce facilities. These facilities include: turnkey store templates, browser-based management, shopping carts, credit card processing, and ad rotation.

Platforms: Runs on Windows 95 and NT.

Pricing: Cost starts from \$799.

Achilles' Heel

I must make an extremely important point with regard to most of these products: their Achilles' heel is often in their ability to interface with existing databases, particularly using an import facility. Some of these products have undocumented "feature anomalies," and others have quirks and idiosyncrasies that make interfacing with other databases difficult.

It is in your best interest to have as open a database as possible — your *primary* evaluation criterion for any of these products should be its tested ability to properly import data from your existing database. If you don't have an existing product database, then you should verify, hands-on, that a product can successfully export and then reimport representative data.

Summary and Conclusions

I began this issue by presenting the results of some research that I recently completed — research that led me to conclude that:

1. Growth in the e-commerce market will be enormous *after the year 2000*.
2. Little, in fact *very little*, attention is being paid to storefront products and development tools.

The current generation of storefront tools is, in my opinion, abysmal. For example, I am not aware of any storefront tool that will alert the designer to something as simple as a dead-end path — a common event, evidenced by my experience on the 1-800-FLOWERS Web site. The storefront product vendors seem to have learned little, if anything, from the past 10+ years of CASE and visual tools development. However, all this will likely change *after* the major vendors have resolved their year-2000 business and turned their attention to e-commerce.

My research identified 33 vendors' storefront development products, including a number of services. (This does not include, of course, the

thousands of ISPs that provide storefront development and hosting services.) I believe you'll find the products I've evaluated here cover the entire spectrum of the storefront market — including a free product, StoreSoft — giving you ample opportunity to familiarize yourself, to varying degrees, with the technology.

On a more global note, living in Europe has provided me with an opportunity to compare the information technology communities on both sides of the Atlantic, and the contrast can be stark. For example, while North Americans are all in a tizzy over the impending technological doom of the "year-2000 problem," my Italian friends are afraid that Italy will sink into the Mediterranean under the weight of all the 2000-year-anniversary pilgrims who will be traveling to Vatican City. And some of my Greek friends think that the "year-2000 problem" refers to the year 2000 BC.

When it comes to e-commerce, there's no question in my mind that North Americans are in a position to dominate this field — and, in turn, have an enormous impact on the world's economy. Of the 33 storefront products that I evaluated, *only one* was clearly identified as a European product; all of the others were apparently North American.

However, few, if any, of these products deal with the idiosyncrasies of currency conversion, customs duties, and varying national laws.

Here's a billion-dollar idea — free with your *CIS* subscription: if the world doesn't come to an end on 31 December 1999, and if the EU successfully consolidates its currency, expect to see enormous e-commerce growth in Europe. And the market for storefront tools and services will be enormous when European companies and ISPs suddenly realize that the North American products can't be easily adapted to the idiosyncrasies of international e-commerce. Just imagine — if you had the tools that could meet these needs.

So much opportunity, so little time.

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