

UIE Fundamentals

Designing for the **Scent** of **Information**



User Interface Engineering
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Jared M. Spool

Christine Perfetti

David Brittan

UIE Fundamentals Reports

There are concepts every web designer should know. These are the concepts that determine how people find and digest information. In other words, how they use the web.

In the UIE Fundamentals Series, User Interface Engineering brings such core concepts to the surface. The series presents proven, time-tested ideas that drive today's most successful designs.

The series opener, *Designing for the Scent of Information*, reveals the techniques by which the most successful designers draw users toward content. We believe the concept of Scent will change the way you think about designing web sites.

Designing for the Scent of Information

Written By: Jared M. Spool, Christine Perfetti, and David Brittan

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martellostudio

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The Scent of Information

Everybody knows that some web site designs are much better at helping users find information than others. But few people know why. It's tempting to assume that the most successful sites have certain advantages—larger development budgets, more sophisticated technology, or designers with more talent.

After watching hundreds of users navigate on scores of web sites, we are prepared to say the most effective sites *do* have advantages, but not the ones people think. The successful site designers all understand how users behave when they're hunting for information.

Those designers know something that eluded us when, years ago, we began observing users on web sites in our lab at User Interface Engineering. At first, we thought users behaved randomly, like fish swimming in the ocean. Some users did well, some didn't, and we had no way of predicting how people would do on each site.

Soon, we began to notice patterns. On some sites, for example, we realized that every user hit the Back button at the same point. We noticed that certain types of links always worked better when arranged in particular ways. All the successful designs were subtly—but distinctly—different from the failed designs. We had to come up with a name for this hard-to-see difference.

A few years earlier, researchers at Xerox's Palo Alto Research Center theorized that when people search a large information space—a web site, for example—they exhibit the same behavior as animals hunting their prey. They become “informavores” on the hunt for information. The PARC researchers called their theory the “scent of information.”

The users we observed seeking content on web sites displayed just such foraging patterns. Our users would search for a scent trail and, once they had picked one up, would follow it toward their content. As the scent got stronger, they grew more eager. When they lost the scent, they backtracked until they picked it up again.

How do you recognize the scent of information? There's not much to see. As you'll come to realize, good scent has certain visible signs. These have to do with the placement of critical information, the length of links and pages, and a few other perceptible elements. Usually,

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however, scent is invisible. It is a product of how well the designers understand the site's users, those users' needs, and how the users access the site.

In fact, the best way to detect scent is to measure the users' confidence (a process we'll walk you through later on). When the scent is weak, users are not confident at all. They doubt their choices. They tell us they are making "wild guesses." They click hesitantly, hoping the site will magically come through for them. More important, they rarely find what they are seeking.

When scent is strong, however, their confidence builds as they draw closer to their content. They traverse the site with little hesitation. Moreover, they find what they are seeking.

Users display just such confidence on all the most successful sites—sites like CNN, BBC, Amazon, Dell, eBay, Lands' End, and the U.S. Bureau of Labor Statistics. Those good designs didn't happen by accident. They happened because the designers understood the scent of information. The designers learned how to apply the principles of scent, how to make content pull users toward it like honeybees to clover. You can too.

Following Scent

The best way to understand what scent is all about is to see it in action. Let's look at how scent helped Doug, a user we tested a few years back. When he came to our lab, Doug had just purchased a Hewlett-Packard DeskJet 722C inkjet printer for \$10 at a yard sale. From the yard sale, he immediately visited his local office supply store and bought the necessary ink cartridges for \$55. Now he had invested \$65 in the printer, but he didn't have the software to run it on his Windows 95 system.



We brought Doug to HP.com to find the necessary software [Figure 1]. He scanned the page and noticed the picture of the CD with the word [Drivers](#) above it.

We've noticed that people looking for information all exhibit similar patterns. They first scan for their *trigger words*—words or phrases they associate with the content they're seeking—in an attempt to pick up the scent. That is what Doug did on Hewlett Packard's site. He clicked on the word "drivers"—one of his trigger words—because it told him he was on the right track.

Oddly enough, Doug had never mentioned the word "drivers" before the page came up—he kept referring to "software." If Doug had not known that a driver was what he needed, he would have failed on the site. But the designers at Hewlett Packard probably figured that any user who could install a driver knew what one was.

When Doug clicked on [Drivers](#), it brought up the HP Customers Service page [Figure 2]. This page demonstrates the power of trigger words. In spite of the clutter, Doug's eyes went straight to the trigger word in the lower right-hand corner, [Printers](#).

Select a Country HP Products HP Services & Support Buy HP

hp HEWLETT PACKARD
Expanding Possibilities

Welcome to HP

SEARCH
ASSISTANCE

Company Information
Investor Information
HP Realignment
Jobs at HP
Year 2000

E-services
Small Business

OnlineStores

Drivers
European Server

THE FIFA WOMEN'S WORLD CUP
1999 HP CELEBRATES THE WORLD'S MOST POPULAR SPORT

photos ©Mike Stahlschmidt

Highlights

- [Visit the New HP Business Store and Buy Direct From HP. One-stop Shopping Via Phone or Web for All Your Business Computing, Networking, Printing and Accessory Needs.](#)
- [HP Introduces Linux-based HP VISUALIZE Personal Workstations.](#)
- [Get the Latest Information on the HP LaserJet Women's Challenge Cycling Race -- Details Updated Daily.](#)
- [Learn How E-services Can Drive Your Organization at the HP World '99 Conference & Expo, Aug. 15-20, San Francisco.](#)

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hp HEWLETT PACKARD
Privacy Statement Use of this site indicates you accept the Terms of Use. © 1994-1999 Hewlett-Packard Company

Figure 1: The HP.com home page when our user, Doug, visited to find his driver.

As soon as Doug identified the [Printers](#) choice, he clicked the Next button and moved right on, with no hesitation. Our research consistently shows that, on a well-designed page, the user's trigger words will jump right out, regardless of how much other content the designers provide.



At this point, the site started to bully Doug with a series of questions designed to winnow down the list of possible drivers. What type of printer? What series? Which model in the 700 Series? Finally, after all these questions, Doug specified the HP DeskJet 722C Printer.



Figure 2: When Doug clicked on the Drivers link, he saw this very busy page.

You might think a site would annoy a user when it badgers them with questions. Yet these aren't just any questions. These questions show the site is becoming more specific. Moving from general information to specific information gives users the necessary confidence that they are on the right track. With each click, they feel they're getting closer to their goals, so they continue to search for their content.

When he arrived at the HP DeskJet 722C Printer page [Figure 3], Doug encountered a couple of glitches. First, he noticed the [Drivers & Software](#) link in the center of the page.



Even though Doug had already informed the site he was interested in drivers, here the site was asking him yet again to specify what he wanted. Did this put him off? Not at all. As long as a site is bringing them to where they want to go, users seldom complain that a site isn't listening to them. They have the confidence to go forward.

The second bump in the road occurred when the site offered Doug a choice between two similar-sounding drivers, both of which worked with Windows 95.

Microsoft Windows 95 Notify Me

When new software becomes available

Single driver download			
HP DeskJet 720C Series Driver	ver. 10.1	2.56 MB	more info
HP DeskJet 720 Series Printer Driver	ver. 10.3	4.80 MB	more info

What is the difference between a 720C Series Driver and a 720 Series Printer Driver? Although Doug stumbled over this question for a moment, he recovered quickly. It turned out that both drivers contained the software necessary to run the printer.



Figure 3: HP.com's DeskJet 722C Printer Customer Care Page.

In seven clicks, Doug had found exactly what he was seeking. This is what happens when scent works.

Things that Block Scent

As Doug's experience showed, there are many ways designers can enhance scent on a page. Unfortunately, there are even more ways to prevent scent from working. Another user in our lab attempted to find a driver for the same printer, the DeskJet 722C, on the same site, HP.com, but with very different results. Let's look at a few of the scent blockers this user encountered.

Iceberg Syndrome

When our user—Linda was her name—arrived on Hewlett Packard's home page, she missed one critical piece of information that Doug had managed to find: the [Drivers](#) link [Figure 4]. Even though the link is visible in our screen shot, on Linda's screen it fell just beneath the fold, the imaginary line on the page at which users need to scroll.

In general, there's nothing wrong with placing links beneath the fold. The idea that users won't scroll is only a myth. Our research shows that users are more than happy to scroll, so long as the designers do nothing to prevent them from doing so. (We'll talk more about scrolling a little later.) What prevented Linda from scrolling on this page was the content in the center, which contained marketing messages about Hewlett Packard. Linda told us this content was just "marketing fluff" [Figure 5].

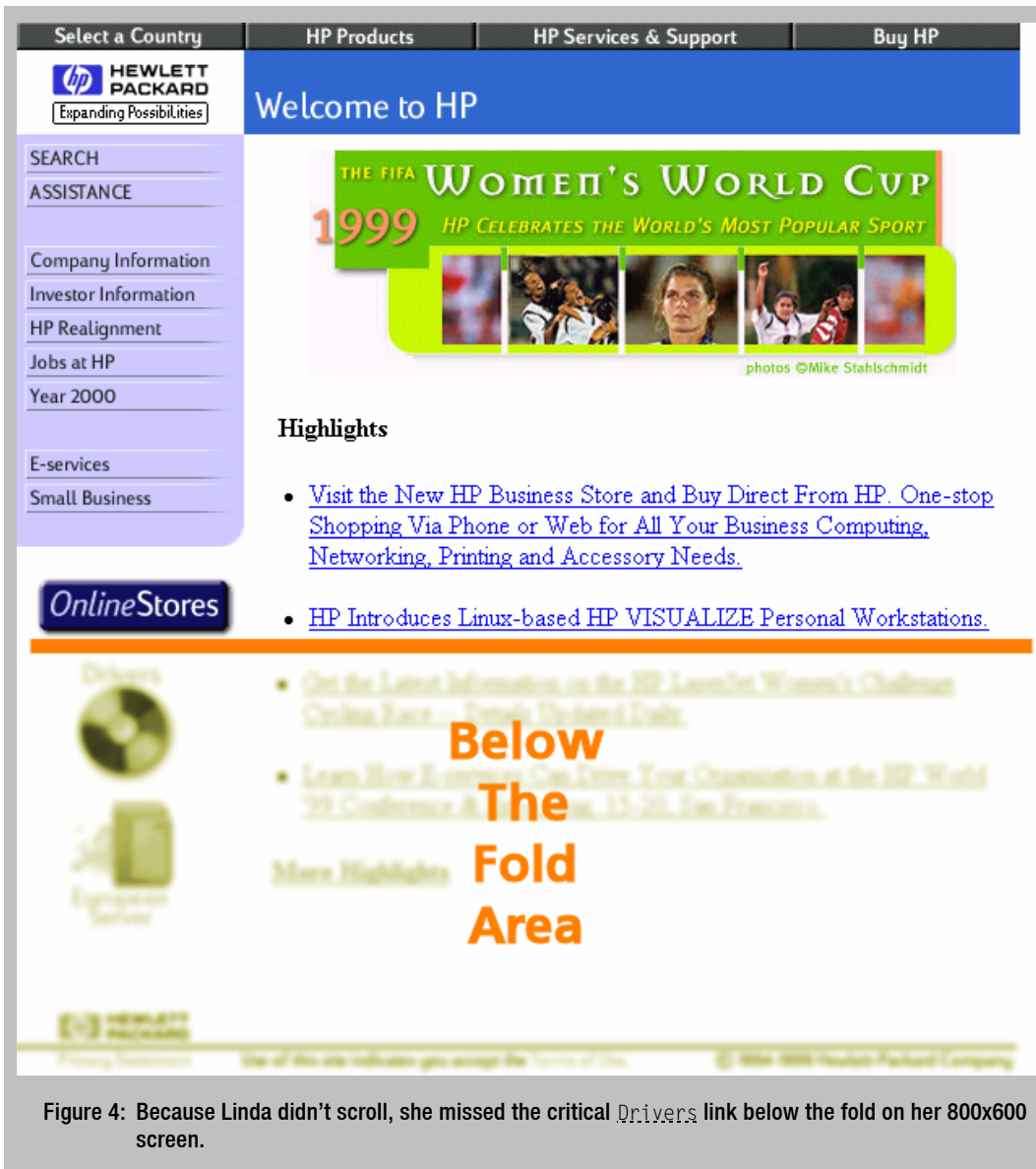


Figure 4: Because Linda didn't scroll, she missed the critical `Drivers` link below the fold on her 800x600 screen.

Linda assumed that any content below the fold would be even less interesting to her than what was above the fold, and so she didn't bother to scroll.

We call this phenomenon *iceberg syndrome*. It happens when users assume that the above-the-fold content represents the tip of the iceberg, and that the unseen content is more of the same. In this case, iceberg syndrome prevented Linda from finding the `Drivers` link.

Camouflaged Links

Unbeknownst to her, Linda had another chance to find her driver quickly. She could have clicked on the `HP Services & Support` link at the top of the page. That link would have brought her straight to a page that listed the necessary drivers.

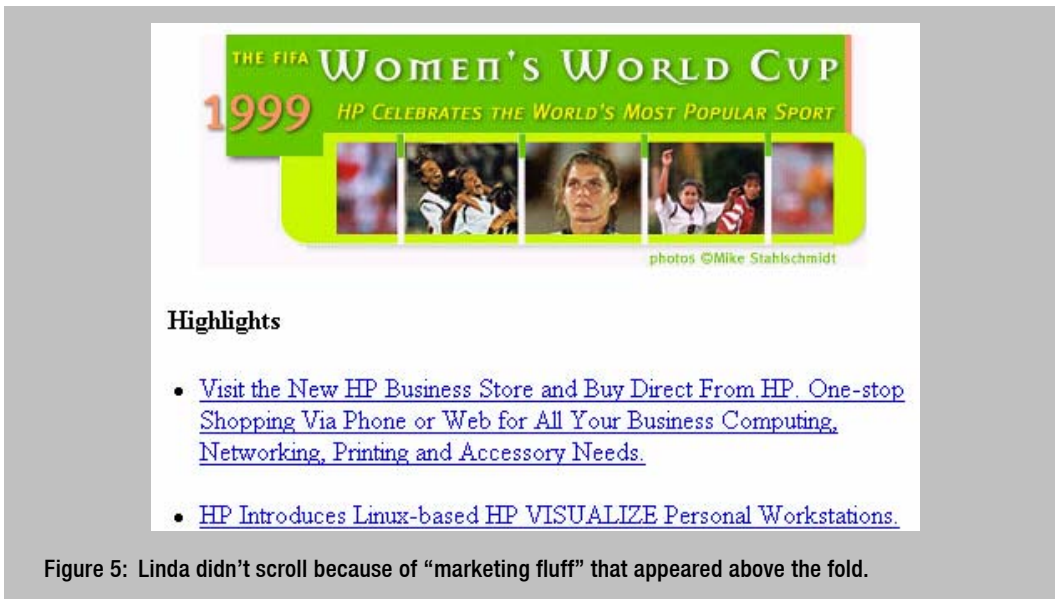


Figure 5: Linda didn't scroll because of "marketing fluff" that appeared above the fold.

One thing that may have stumped Linda is the link doesn't look like a link. The web has done an excellent job of training people to think that links are blue and underlined. When we hitch users up to an eye-tracking device, we see their gaze go straight to the blue underlined text on a page. This [HP Services & Support](#) link is neither blue nor underlined. Instead, the link appears as a graphic that looks more decorative than functional. Linda might not have realized the graphic was something she could click on—if she had seen it at all. That brings us to another scent blocker.

HP Services & Support

Banner Blindness

Linda probably never saw the [HP Services & Support](#) link, because it appears in the top 60 pixels of the home page. What typically appears in the top 60 pixels of a home page? Banner ads. Our research has shown that users typically ignore information presented in that portion of a home page. Such *banner blindness* occurs because the web has trained users that nothing of value ever happens in banner ads.

So, after scanning the page and not seeing anything that contained scent, Linda did what pretty much everyone does: she clicked on the only link that seemed to offer a prayer of getting her to her desired content: [Search](#). What a rabbit hole that turned out to be.

We'll come back to Linda and her adventures in Search Land, which so fascinated us that we want to go into them in some detail. Meanwhile, let's look at some other common ways in which designers throw users off the scent.

Links That Lie

As we've mentioned several times, there is a strong connection between a web page's scent and the user's confidence. When the scent weakens, so does the confidence of the user. It works the other way, too. When users lose confidence, they start to think the scent is weak.

Users are especially apt to lose confidence when the site lies to them. On an old version of the Discovery Channel site, for example, one of our users clicked on a link for a “complete list of the Discovery Channel Home Videos.”

Imagine the user’s disappointment when the next screen contained not the promised complete list but just the most popular videos. The user said, “Why can’t they just tell me they only offer the bestsellers?”

We’re sure the site’s designers didn’t mean to mislead. Nevertheless, when it happens, it stops users in their tracks. We’ve watched many users lose confidence when links don’t deliver the content they promise.



Missing Words

Confidence also plummets when a new page, appearing after the user clicks a link, doesn’t contain the trigger words from the link that led to it. Have you ever found yourself poring over a web page, wondering why the site took you there? Was it because the trigger words were nowhere in evidence? Have you ever had to use your browser’s Find function to hunt for the trigger words on the page?



That happened when a user tried to renew his subscription to the Ziff Davis magazine *PC Week* (the precursor to *eWeek*) on ZDNet. He recognized the image of the magazine among the other publications that Ziff Davis offers and clicked on it.

The subsequent page had nothing to do with *PC Week*. It was a listing of more than 400 publications, in alphabetical order. The user had to click three more times before finding any mention of *PC Week*. We’re glad to report that *eWeek* subscribers are no longer subjected to any such rigmarole.

Cute Link Names

Many sites try to be clever in the labeling of links on a page. Unfortunately, this strategy often backfires, making it difficult for users to know where to click.

At one time, the Library of Congress, afraid to appear boring, assigned cute names to its online databases of legislative information: THOMAS and Will T. Bill. While we can understand the library’s desire to make things lively, it didn’t go over well with our users.

- [THOMAS](#) - Legislative information from the Library of Congress
- Search Legislation on the House WAIS server with help from [Will T. Bill](#)

The result: users didn’t know what the links were. If the associated text didn’t offer at least some clarification, the users would’ve been completely lost.

It’s extremely tempting to use marketing names, clever buzz phrases, industry terminology, and cute nicknames to make things seem fun or interesting. But using obscure terms in the link just weakens the scent and frustrates the user. Unfortunately, *clarity always trumps fun*.

Misplaced Links

On some sites, links appear in entirely the wrong context. We watched Tim, a user on Boston.com, the *Boston Globe's* web site, trying to find out when the Boston Red Sox would next play the Toronto Blue Jays. On the home page, Tim clicked on the [Red Sox](#) link, which took him to a page in the sports section devoted to all things related to the Boston team.

At the bottom of the screen, Tim clicked on a [Sports Calendars](#) link, telling us he was “very confident” he was on the right track. He said he expected the link to lead straight to the Red Sox schedule. But that’s not where he ended up. Instead, he ended up on a page listing all the things to do and places to go in the Boston area. Nowhere on the page was there any specific information on the Red Sox. Tim was baffled.



- BOSTON GLOBE [Things to Do](#) - sports and events activities calendar
- BOSTON GLOBE [Places to Go](#) - professional and collegiate sports activities
- GLOBE CALENDAR [Outdoor Activities](#) - walks, tours, and more
- [Appalachian Mountain Club](#) - your guide to the Northeast outdoors
- [Unique Sports](#) - skydiving, paintball, frisbee, and more
- [Cape Cod Activities](#) - activities along the seashore
- [Bay State Games](#) - Participate in Bay State Summer Games.

When we talked with the designers of Boston.com, they explained that they hadn’t intended the [Sports Calendars](#) link to be specific to the content of the Red Sox page. On the contrary, they pointed out that the same three links appeared on every page of Boston.com’s sports section.

Not only did Tim not know that, he didn’t realize there *was* a sports

section. Clicking on the [Red Sox](#) link on the home page, he had encountered nothing labeled “sports” or “sports section.”

Users and designers view the same site from different perspectives. Designers see entire sections, while users see only the pages they visit. The three links that made perfect sense to designers made no sense to Tim, who had no concept of a section. The links might as well have carried a warning label that read: “Chances are these links don’t lead to what you’re looking for.”

[Sports/Outdoors](#) ♦ [Sports News](#) ♦ [Sports Calendars](#)

Today, sports fans can have an easier time finding team schedules on Boston.com [Figure 6]. They just click on the [Schedule/Results](#) link on the page devoted to the team of their choice.

The Boston Red Sox

<p>News and stats</p> <p>■ BOSTON GLOBE Latest coverage Including all your favorite Globe columnists.</p> <p>Player profiles Also includes player statistics and ticket information.</p>	<p>Top Sox Links</p> <p>Depressing Red Sox Page 79 Years and Still Counting!</p> <p>Bostonredsox.com An unofficial site, designed and maintained by students.</p> <p>The Confederate Home Page Over 230 pages of information, facts and fun on the Sox.</p> <p>The Curse Lives On! A long history of heartbreak for Red Sox fans.</p>
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[Sports/Outdoors](#) ♦ [Sports News](#) ♦ [Sports Calendars](#)



PATRIOTS

SCHEDULE/RESULTS



Sunday	1	2	F
Patriots	13	0	13
Jets	7	0	7

[Box](#)
[Scores](#)
[Stats](#)

Next: 10/31 @ PIT

[Pats schedule/results](#)

AFC EAST STANDINGS

	W	L	Pct.	GB
Patriots	6	0	1.000	--
Jets	5	1	.833	1.0
Bills	1	5	.167	5.0
Dolphins	1	6	.143	5.5

[More standings](#)

[Roster](#)
[Statistics](#)
[Wallpaper](#)
[Schedule/results](#)
[Chat room](#)
[NFL TV schedule](#)
[NFL scoreboard](#)
[NFL team-by-team news](#)

Miller a return man

For a guy about to play his former team for the first time since being let go during the offseason after eight years of quality service, Josh Miller shows no signs of reticence or resentment. (By Joe Burris, Boston Globe)

Receivers catching up

Wide receiver Troy Brown, who injured his right shoulder Oct. 3 against Buffalo, practiced yesterday in a red (no contact) jersey, and is still listed as questionable for Sunday's game in Pittsburgh. (By Joe Burris, Boston Globe)

Talk of tough winds at Heinz Field was just hot air, says Josh Miller. (Globe Staff File Photo / Tom Landers)

- ▶ **OIL FOOTBALL:** [Cowher the last word](#)
- ▶ **SPORTVIEW:** [Lately, it's been fast times](#)
- ▶ **BEIGALS 23, BRONCOS 10:** [Bengals change stripes](#) (Boston Globe)
- ▶ **NFL: WEEK 7:** [They can't get a break](#) (Boston Globe)
- ▶ **PATRIOTS 13, JETS 7:** [Timing is perfect](#)
- ▶ **OIL FOOTBALL:** [Reason for the streak? It happens](#) (Boston Globe)
- ▶ [Dillon more than willing to go extra yard](#) (Boston Globe)
- ▶ [Givens and Patten are on receiving end of praise](#) (Boston Globe)
- ▶ [Brady showing he still knows the drill](#) (Boston Globe)

Figure 6: Today, Boston.com visitors can easily find the schedule for their favorite teams with the Schedule/Results links.

The Search from Hell

Now back to Linda. As you recall, she was having trouble finding a driver for the DeskJet 722C inkjet printer on the Hewlett Packard web site. She thought she could pick up the scent by clicking on Search.

The trouble is search engines are scentless. Regardless of the content that is behind them, nearly all search boxes on all sites look the same, with a box to type into and some button to start the search.



When users arrive at a web page that contains a search window, they at first behave the way visitors do on any site: they scan the page for their trigger words or any recognizable synonyms. Only when they can't find their trigger words do they resort to Search.



Figure 7: Upon clicking the home page [Search](#) link, Linda found herself on this page.

What words do users type into the Search box? Why, their trigger words of course. It's as if they were attempting to create their own link. When users go to Search, they are signaling to the designers that they aren't picking up scent on the page. Let's see how Search worked for Linda.

Clicking on the home page's [Search](#) link brought Linda to the site's Search page, allowing her to search the entire site [Figure 7].

Interestingly, the [Drivers](#) link that got lost below the fold on the home page now appeared clearly above the fold. But Linda didn't click on the link. That's because of a phenomenon we call "When Users Decide to Search, Damn It, They Are Going to Search!" She typed her trigger words, "DeskJet 722C Driver," into the Search field.

Now, from our earlier user, Doug, we knew that there were two Windows 95 drivers for the DeskJet 722C Ink Jet Printer. Which is why everyone was surprised when, after Linda typed "DeskJet 722C Driver" into the Search box, the HP site returned 24,309 results [Figure 8].

Search engines seem to go out of their way to return the largest number of results they can. Certainly, 24,309 results is a very large number. However, Linda didn't want a large number of results. She wanted just one result—the driver for her printer.



The site's search technology tried to help Linda choose from among the 24,309 results by providing a relevancy rating. Unfortunately, our research shows that users really don't understand this rating. After all, how does a user know the difference between 88, 86, and 85 percent relevant?

Linda did what most users do in this situation: she scanned for the most likely link—the link with the best scent. To Linda, however, no link offered very good scent. She finally chose the link with the phrase “What Ships in the Box,” reasoning that the drivers must come in the box with the printer. How confident was she that the link would take her to her driver? Linda's words: “It's a wild-ass guess.”

Scent is about confidence. When users lose confidence, they are telling us the scent is weak.

Information Masking

When Linda clicked on “What Ships in the Box,” the site presented the various components that come with the printer [Figure 9]. The page contained a [Drivers & Software](#) link. If Linda had clicked on it, she would have found exactly what she was looking for. Instead, she fell prey to a phenomenon called *information masking*.

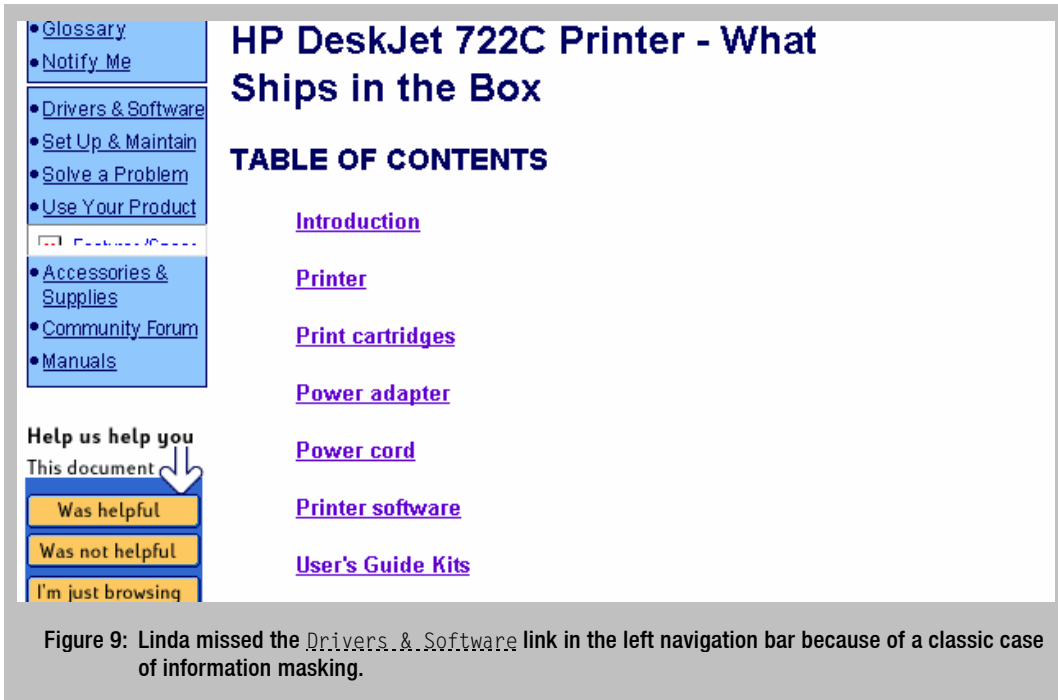


Figure 9: Linda missed the [Drivers & Software](#) link in the left navigation bar because of a classic case of information masking.

Web pages are busy visual spaces. When users are having trouble finding what they want, their brains tend to mask out sections of the page that never bear pertinent information. For example, if useful material always appears in the center column, the user masks out the other columns.

That’s what happened to Linda. Having repeatedly found links at the center of the screen, she stopped looking at any links that appeared on the right. Therefore, she completely overlooked the [Drivers & Software](#) link.

What Linda did notice was the [Printer Software](#) link in the center of the screen. Since this link contained her trigger words “printer” and “software,” her confidence soared and she willingly clicked on.

Silly her. All she got for her trouble was this text, which described what software comes in the box but does not link to the drivers. In fact, it doesn’t link anywhere.

PRINTER SOFTWARE ([back to Table of Contents](#))

Description	Quantity
HP DeskJet Printing System for Windows v10.0 bundled with HP Creative Solutions Kit	2 CD-ROMs

Linda had hit a dead-end. She had followed what, to her, seemed the best scent available and, because of a slight wrong turn on the home page—her failure to scroll down to the [Drivers](#) link—had ended up losing the scent entirely. Users’ only options at this point are to backtrack until they pick up a better scent or to give up. Most users who encounter this type of failure choose the latter.

Byzantine Policies

After Linda’s experience, we asked the developers at Hewlett Packard why the Printer Software page did not link to any software. They blamed a geographic restric-

tion. It turns out the team that developed this page worked at HP's office in Vancouver, Washington. The team in charge of the page that lists the drivers worked out of Roseville, California. We wondered if Hewlett-Packard corporate policy prohibited people in the State of California from talking to people in the State of Washington—or was it a question of Oregon State Law?

On further investigation, we learned that, at the time the teams created these pages, HP had a policy against “deep linking” (linking to a page other than a home page) from one part of HP's site to another. Operating independently, the teams couldn't control when each other's pages would move, creating the dreaded 404 (Object Not Found) error. Since deep linking was restricted, corporate policy prohibited the Vancouver folks from linking to the actual software that was available on the site. They could only describe it.

For more information on how users interact with Search, see the UIE Best Practices Report [Getting Users to What They Want](#) available on www.uie.com.

As is typical, the site's search engine prevented Linda from picking up a scent. It's possible, of course, that HP's designers could rejigger the search engine to provide exactly what Linda wanted. Should they? Simply making the link to the drivers more prominent on the home page would solve the same problem at a fraction of the cost.

Navigation-Panel Shell Game

Search is not the only site feature that explicitly prevents scent from getting through. Navigation panels can often have the same effect. Designers understand that each link in the navigation panel represents a large amount of information, so they make each link as general as possible. The more general and the less descriptive the link, however, the less likely it is to contain the user's trigger words.

One user likened the categories in navigation panels to playing an old-fashioned shell game. The design forces the user to guess which shell contains the magic pea. In the shell game, the goal is to make each shell look identical so that the user *can't* guess correctly. Designers need to approach the problem from the opposite direction: each shell should be, in effect, transparent, letting the user see the content right through it.

Categories that Belong on *Jeopardy*

Ken came to our lab looking for the first Tom Clancy novel that featured the fictional hero Jack Ryan. When Ken visited Amazon.com, the navigation panel didn't give him enough information to decide which link to click.



Ken couldn't decide whether the content fell under [Bestsellers](#), [Featured in the Media](#), or [Award Winners](#). He knew that many Tom Clancy books were top sellers. At the same time, he knew the books received a lot of press and could very well have won

awards. Baffled, Ken did what most users do when they run out of scent: he went to Search.

Amazon's latest design narrows the choice down to [Bestsellers](#). Unfortunately, since this link shows only the most recent best-selling books, it's unlikely it would go back to the *first* Tom Clancy book to feature the Jack Ryan character.

Another user, Janice, arrived at our lab in the throes of a strange stomach condition. Gastroparesis, her doctor had called it. We watched as Janice went to Dr. Koop's site to find information about this mysterious ailment. Most of the navigation links sounded the same: [Health.Topics](#), [Healthy.Body](#), [Healthy.Lifestyle](#), and [My.Health.Page](#). What was the difference between them? These categories could be the first round of *Jeopardy*. ("I'll take 'things that ooze' for \$600, Alex.")

[home](#) [health topics](#) [diseases & conditions](#) [healthy body](#) [healthy lifestyle](#) [news](#) [resources](#) [my health page](#) [search](#)

Janice clicked on [Diseases.&Conditions](#), believing the page would describe gastroparesis, but, alas, it did not. The definition of gastroparesis was hiding under the link [Resources](#).

When we asked the designers at Dr. Koop why the definition for gastroparesis wasn't under [Diseases.&Conditions](#), they initially told us it was because gastroparesis isn't actually a disease or a condition—it is a symptom. While that may be true, we pressed a little harder and discovered a deeper reason.

It turns out that the content for the definition did not originate at Dr. Koop. Instead, the site had purchased a dictionary of medical terms from a third party. The designers had decided that all third-party content, including this dictionary, should appear under [Resources](#).

We can't say whether placing a site's third-party content under a single link is a good policy or not. When designers make policy decisions about content placement, however, they have to communicate those decisions to the users. Designers communicate decisions through links. If the links are not effective, users won't know the policies and won't find the content.

Inscrutable Jargon

This is the navigation bar from an early version of Fidelity.com:



Now, we're not even going to mention the two links in the upper left—[Fidelity.com](#) and [Home](#)—that went to *completely different* pages. Instead, we want to tell you about Matthew, a hardworking 26-year-old who, two years earlier, had landed an excellent job fresh out of college. By living conservatively, he had saved up a decent nest egg. Friends and family were starting to pressure him to think about putting some money away for his retirement, but he had no idea where to start.

That's where things stood when Matthew came to our lab as a user. He wanted to *research* potential options to start *planning* for his *retirement*. So, imagine his confusion when presented with three separate links: [Research](#), [Retirement](#), and [Planning](#).

If you work in financial services, you know exactly what these three terms mean. Unfortunately, outsiders don't. Industry terminology can be a helpful shortcut, so long as you can count on users' understanding it. When your users come from outside your industry, jargon can block your scent.

Fidelity has since purged its navigation bar of such jargon. Testing has shown that their designers have significantly improved the scent since those early days.



Longer Is Better

We often tell our clients something they find counterintuitive: Don't worry about keeping things short. Focus on ensuring that all the necessary trigger words are on the page. That often means making both links and pages longer. For many, this advice goes against everything they've learned about being concise. Yet we've repeatedly found that longer links and pages make for better scent.

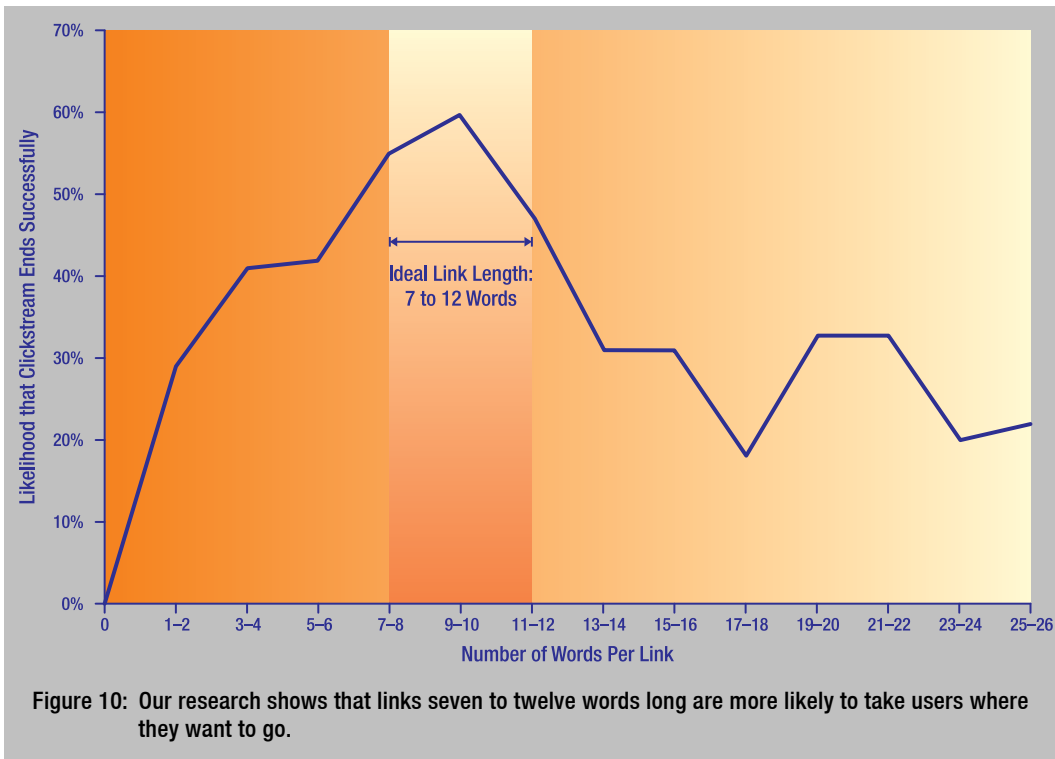
Longer Links Say More

If you look closely at the links in the navigation panels we just studied, you will notice that they are all between one and three words long. While this is extremely common for navigation panels, it also is indicative of problems we consistently see across many sites.

In our research, we've collected hundreds of clickstreams (sequences of clicks that users make when trying to accomplish their objectives). We sorted the clickstreams into two groups: the clickstreams where users succeeded and the clickstreams where users failed. Then we looked for patterns in each group.

One of the first patterns to emerge had to do with the optimal number of words in a link. The best-performing links were between seven and twelve words long.

In the chart in Figure 10, the horizontal axis represents the number of words in each link. The vertical axis shows the likelihood that a link will bring users closer to what they are seeking. (As you would expect, a zero-word link has a zero chance of succeeding.) While the average success of all links was about 43 percent, links containing seven to twelve words did substantially better.



Why did links with six or fewer words do less well? The answer is that it's a game of probability. A seven-word link is more likely to contain the right trigger words than a one- or two-word link. The more likely a trigger word is to be present, the more likely the link is to give off good scent. This doesn't mean that a one-word link never gives off good scent. In the Hewlett Packard example, the word "Drivers" gave off great scent for the users who saw it.

Most often, though, short links work only when trigger words are nearby. CNN.com is adept at that practice. The site uses many short links, like [U.S.](#) and [WORLD](#). What's the difference between U.S. and World? Sometimes, it is not clear.

For example, a user wondering about the spread of SARS in North America might not know where the editors of CNN have decided to put the SARS-related stories. After all, something like SARS could be either a U.S. or a World story.

CNN strengthens the scent of short links by following them with lists of longer links that are heavy on the

trigger words. Noticing the site already lists SARS in a story under [WORLD](#), the user knows to start there, even though the page doesn't mention SARS in North America.

If the optimal length of a link is a game of probability, why don't links that are 13 or more words work well? At some point, the trigger words get lost in the surrounding text. Too many words in the link and the users can't see the individual trigger words they need.



Longer Page, More Scent

Many designers fall for the common myth that users don't want to scroll. As a result, they build short web pages with only a small amount of content and a few links, but with the supposed virtue that they require no scrolling.

The problem with short pages is they block scent. They limit the amount of content that is immediately available to users. To see more, users must pick a link in hopes of finding useful information on subsequent pages. If they don't succeed, they resort to jumping back to the previous page.

Our research shows that longer pages increase the likelihood users will find the content they want. Users on CNN, Yahoo, or Amazon have no problem scrolling the long pages on those sites to find the content they were seeking. We've seen that users are very willing to scroll as long as the content above the fold tells them it's worth scrolling.

As we suggested earlier, careless page design can deter users from venturing below the fold. This is evident on an old version of the Sprint home page [Figure 11].

Users in our studies didn't realize that this page contained two more screens beneath the fold. The Sprint designers had made certain choices that suggested to users there was no point in scrolling. First, they included a *horizontal rule* at the bottom of the page.

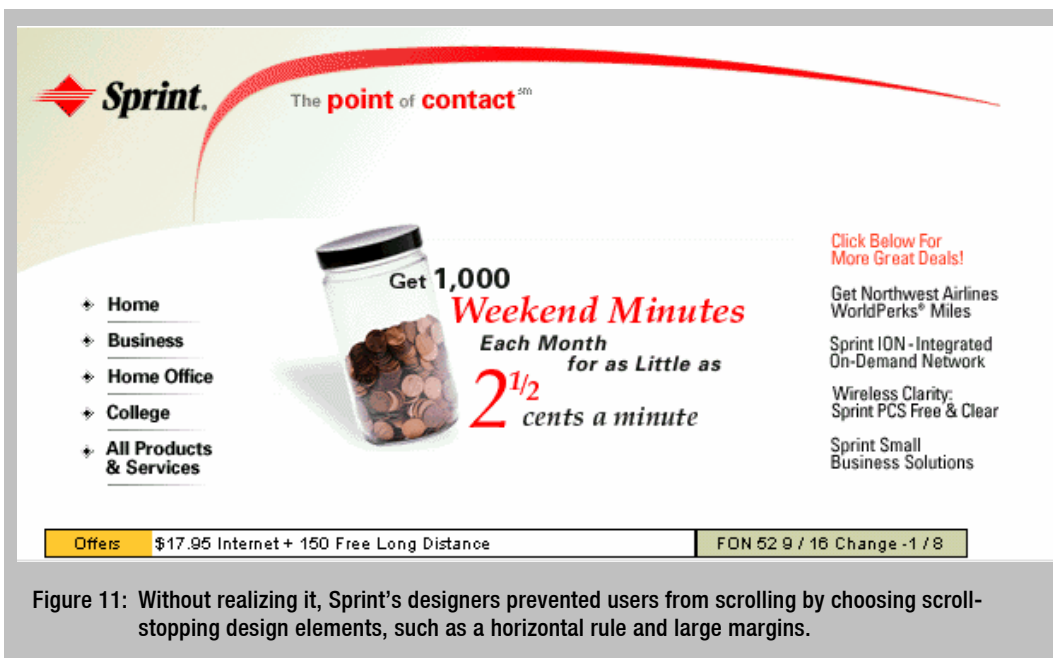


Figure 11: Without realizing it, Sprint's designers prevented users from scrolling by choosing scroll-stopping design elements, such as a horizontal rule and large margins.

A horizontal rule acts as a border on the screen, a signal to stop scrolling. Second, the designers inserted a *large margin* after the horizontal rule, a margin that just happened to fall on the fold boundary. This unfortunate coincidence suggested to users there was nothing further to see. Had some content worked its way up on the page and eliminated the margin, users would have known to continue scrolling.

The current Sprint site remains wedded to using a large number of horizontal elements, any one of which could—depending on the size of the user’s screen—signal the end of the page [Figure 12]. If asked to test their most recent designs, this is something we would certainly be looking for.

For more information about how users scroll, see the article [As the Page Scrolls](#) on [www.uie.com](#).

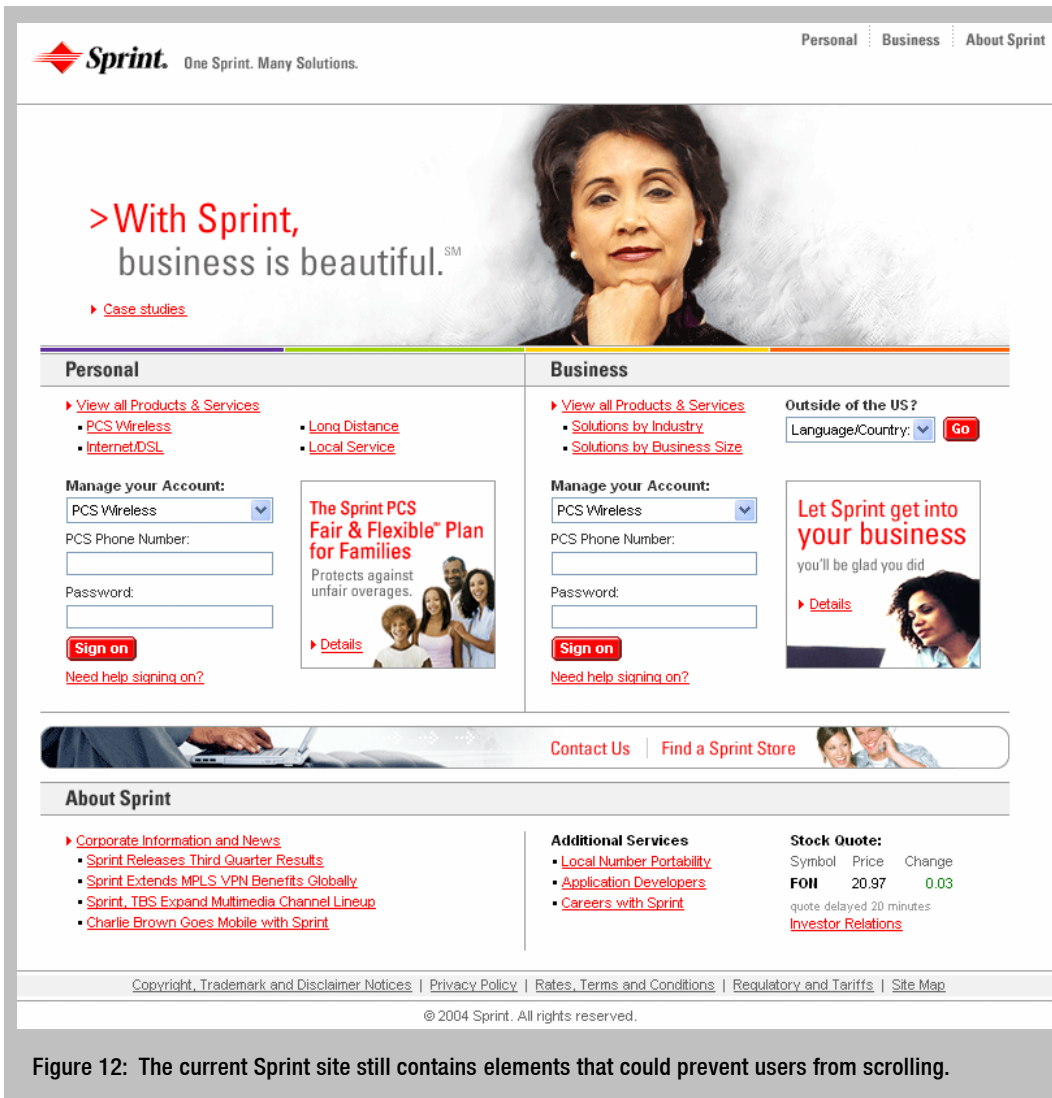


Figure 12: The current Sprint site still contains elements that could prevent users from scrolling.

Designers need to be aware of these *scroll stoppers* and ensure that they aren’t accidentally putting them in the wrong place. With adequate attention to maintaining a sense of flow, designers give the user “permission” to scroll. In so doing, they give *themselves* permission to build longer pages—pages that emit more scent and give users a better shot at finding the content they want.

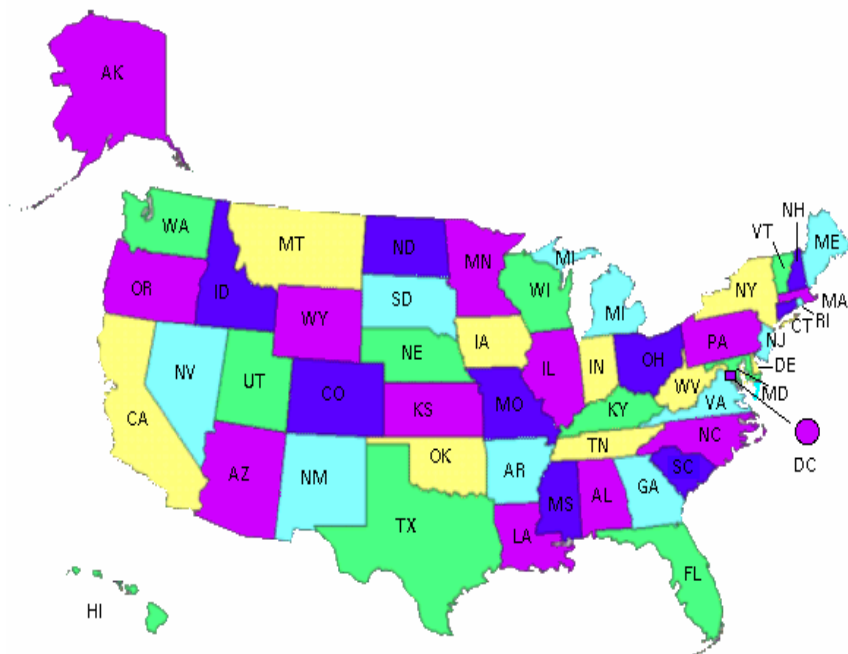
The Scent of Graphics

Over the years, User Interface Engineering has developed a reputation for being down on graphics. We earned some of this with our 1997 publication *Web Site Usability: A Designer's Guide*, in which we stated, "Graphics neither helped nor hurt a web site." Since then, we've investigated the topic more thoroughly and concluded there isn't just a single type of graphic. Instead, there are three types: *navigation graphics*, *content graphics*, and *decorative graphics*.

When we look closer at the three types of graphics, we can see that navigation and content graphics can help users a lot, while ornamental graphics contribute little to usability.

Navigation graphics

Certain types of images give off scent because they help users understand what they will see once they click. These are what we call navigation graphics.



In the image above, from the U.S. House of Representatives web site, Arizona residents interested in finding their state representative need only click on the portion of the map labeled AZ. Anyone familiar with U.S. geography will easily find the right link.

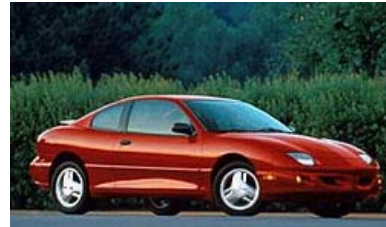
However, designers must use navigation graphics with care. One problem with using graphics, even graphics of text, is that they often don't look like links.

We've seen sophisticated users wave their mouse around the screen, waiting for the browser to send them a sign. We've also seen many users miss the links entirely. Navigation graphics work best when users can clearly identify what is a link.

Content Graphics

Sometimes the best way to communicate information is with a picture. Content graphics are images that communicate content directly.

Amy came to our lab interested in buying a new car. She knew she wanted one of GM's sporty two-door coupes, but she didn't know its name. That's understandable. Many GM cars have similar names: Firebird, Skylark, Skybird, Sunbird. She just didn't know. Photos of cars on Edmunds.com helped her tremendously.



The moment Amy saw the picture above, she exclaimed, "That's it!" The picture, while quite dull when viewed out of context, was very exciting for Amy. As a content graphic, it did its job.



One day, we had the opportunity to watch a user, Mitch, spend 2½ minutes downloading this image on the equivalent of a 14.4 kbps modem.

For what seemed like ages, Mitch sat entranced by his browser as the image slowly materialized. As soon as the entire image had loaded, he shouted, "That's fabulous!" and proceeded to place a \$38 bid on the tin. (We don't think it cost \$38 when it was new and filled with fresh coffee.)

Mitch was an avid restorer of antique coffee cans. He regularly purchased cans just like this, painstakingly restored them, and resold them for hundreds of dollars. The image, albeit tremendously slow to load, told him everything he needed to know to bid on this item.

By the way, the image so mesmerized Mitch that it never occurred to him the modem was slow. This is a common behavior we see—users don't mind slow downloads when they are getting what they are looking for.

For more information on how people deal with slow downloads, see the article [The Truth about Downloads](#) on www.uie.com.

Decorative Graphics

Designers often turn to images to make a site feel fun, authoritative, or professional. Such ornamental graphics may provide a site with visual flair, but we've found that they neither help nor hurt the user experience. We can measure users' perceptions of sites as being fun, authoritative, and professional. What we've learned is that the presence of a decorative graphic usually has no effect on those attributes.

Sometimes, however, decorative graphics can backfire on the designer. An image from the site of National Public Radio's popular "Car Talk" program depicts the show's co-hosts in surgical garb



operating on an engine block. The site has many similar caricatures, obviously meant to bring the same whimsical elements of the radio program to the site.

One of our users was having a hard time scouring the Car Talk site for information on tire rotation. When she encountered the surgery cartoon, she turned to us and said, “I’d be happy if the designers spent as much time organizing the information as they did making these cute graphics.” She was not amused, she was frustrated. Our research has proven repeatedly that if a site’s organization isn’t working, users are unlikely to rate the site as fun, authoritative, or professional, no matter how great the graphics are.

We’re not saying that designers *shouldn’t* use decorative graphics. We’re only suggesting that they focus their efforts on the elements of design that matter most to their users.

Designing for Scent

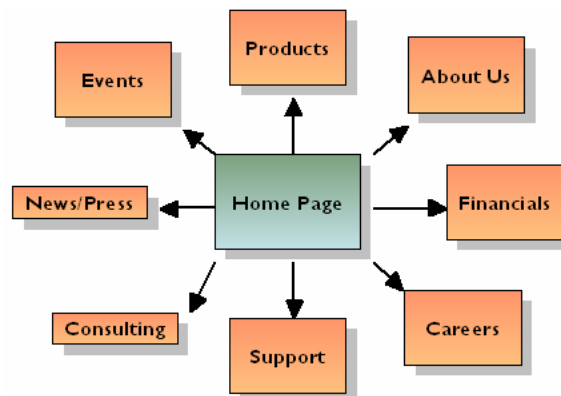
Scent may be a natural phenomenon, but designing for scent doesn’t come naturally. When we interview designers who have created sites with excellent scent, we invariably learn they have undergone a fundamental change in their approach to design.

Conventional web designers approach a new site by starting with the home page. To them, the home page is the center of everything. When designers focus on the home page, they are thinking in terms of navigation.

Consequently, they ask the wrong questions: Where are all the places a user might want to go? What clever names do we want to call our sections? How can we make sure users understand *our* agenda?

Such designers are thinking about how to push the user off the home page to different parts of the site. This approach often forces designers to think about populating the home page before they even understand what the site’s content will be. Teams can spend weeks arguing over the exact wording of inscrutable links in unfathomable navigation bars.

This approach is popular and largely unquestioned, but it often fails to yield a usable site. The failure comes from the designer’s focus on *structure* instead of *content*. Users don’t care about the site’s structure. They are interested purely in finding content that lets them achieve their goals. The conventional approach to design forces the designer in the wrong direction.

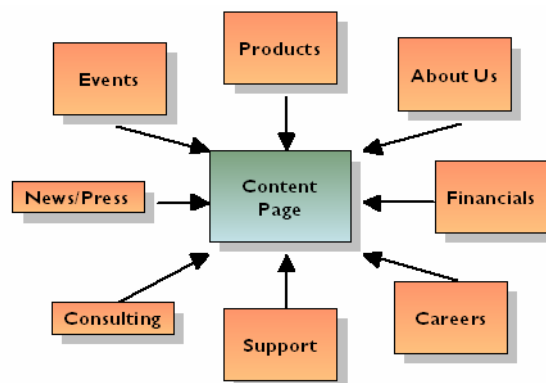


Content Must Rule

To design for scent, you have to start with the content pages and worry about the home page later. You start with the most important content and determine the most effective trigger words. You then place those trigger words on the pages where users will need them. Now that content is key, you find yourself asking an entirely different set of critical questions:

- Why are users coming to the site?
- Which page is most important to the user?
- How will users find this page?
- What are the users' trigger words?
- Where are they likely to look for those words?

By focusing on the most important content, you will end up creating a structure that reflects the priorities of the user. Most of the highly successful sites on the Internet share this approach. Attend to the content and the structure will take care of itself.



Measure Users' Confidence

Attending to the content means, among other things, making sure that each link you create and each page you build is emitting the right scent. Moreover, as we are fond of repeating, the only reliable way to judge scent is to measure users' confidence.

One way to do that is to look at clickstreams, just as we did. Is your design forcing users to hit the Back button? Do they often resort to using the site's search engine? Users often turn to these devices when their confidence is low, hoping they can pick up the scent some other way. Detecting these subtle clues can help turn a poor site into a great one.

The best way to measure confidence, however, is to engage with actual users as they navigate. In our research, we've found there are two critical times to look for confidence: before the user clicks and right after. Before clicking, users are trying to decide which link is the right one for them. We ask them, "*How confident are you that this link will get you to what you're looking for?*" If the users tell us they are *very confident*, then we know the page probably has the right trigger words and the layout isn't confusing them with too many similar words or visuals.

On the other hand, if users indicate they have little or no confidence—they are in fact guessing—then we can focus our improvement efforts on this page. We make sure trigger words are prominent, the layout communicates the options to the user, and the graphics are adding to the scent of the page.

The story doesn't end there. When the new page appears, it needs to do one of two things: it should either contain the user's target content or give that user a stronger

scent than the preceding page did. Users expect scent to grow stronger until they reach their goal. If the scent weakens, they lose confidence.

As soon as the new page displays, we ask users, *“Is this page getting you closer to your goal or farther away from it?”* The answer tells us if the scent is good and the site is working. If users feel they are moving away from their goal, then either the new page is not communicating properly or the preceding page is giving off the wrong scent.

Does that sound like a lot of effort? It is. Designing for scent requires both collecting timely information about what users will find important and constantly testing your assumptions along the way. But all that hard work pays off when you stand back and realize you have created a web site that emits fabulous scent.

The Tao of Scent

The most successful web designers understand how to create pages that lure users toward the content they need. Here is a summary of what every designer should know about the scent of information.

- The design communicates scent through links. Each link needs to have strong scent for the content that lies beyond it.
- *Trigger words* are the words or phrases that cause users to click. Scent is strongest when the page presents users with the right trigger words.
- Links work best when they are between seven and twelve words long. That is long enough to boost the chances of a user's trigger word appearing in a link, yet short enough to let the user find the word easily.
- Trigger words are extremely powerful. They often jump out of very busy pages that we'd otherwise expect users to struggle with.
- Users expect each click to lead to information that is more specific. They do not mind clicking through large numbers of pages if they feel they are getting closer to their goal with each click.
- Users don't mind scrolling. They fail to scroll only when design elements such as horizontal rules suggest there is nothing more to see.
- Links that appear in the top 60 pixels of the page fall victim to *banner blindness*. Banner ads have done an excellent job of training users to ignore links at the top of a page.
- Users gravitate to links that are blue and underlined. To design links differently is to defy what the web has conditioned users to expect.
- Links should accurately describe what the next page contains. Otherwise, users lose confidence in the site.
- When users click on trigger words, they expect to find those words on the next page.
- Trigger words need to be readily understandable. Jargon and cute marketing terms confuse users.
- Users go to Search only when they can't find their trigger words on the page.
- Relevancy ratings from Search do not communicate scent. Users rarely understand them.
- Users often notice only the section of the page in which they last found something useful. The brain's *information masking* causes them to miss critical links in other sections.

- When users run out of scent, they often backtrack in hopes of picking up better scent. This rarely works, however, since they chose the best scent to start with.
- Links in navigation panels are often too short to emit much scent. They rarely contain the user's trigger words.
- Two types of graphics emit scent: *navigation graphics*, which help users decide where to click, and *content graphics*, which convey essential information. *Decorative graphics*—images that merely jazz up a site—are usually scentless.
- Designers create good scent by focusing on content pages instead of the home page. When they understand which content is most important and how users will access it, the rest of the site falls into place.
- We can't measure scent directly. Instead, we have to look at whether users are confident as they click from page to page.

About the Authors

Jared M. Spool, Founding Principal (jspool@uie.com)

If you've ever seen Jared speak about usability, you know that he's probably the most effective, knowledgeable communicator on the subject today. What you probably don't know is that he has guided the research agenda and built User Interface Engineering into the largest research organization of its kind in the world. He's been working in the field of usability and design since 1978, before the term "usability" was ever associated with computers.

Jared spends his time working with the research teams at the company, helps clients understand how to solve their design problems, explains to reporters and industry analysts what the current state of design is all about, and is a top-rated speaker at more than 20 conferences every year. He is the conference chair and keynote speaker at the annual User Interface Conference, is on the faculty of the Tufts University Gordon Institute, and manages to squeeze in a fair amount of writing time.

Christine Perfetti, Director of Instruction (cperfetti@uie.com)

When you talk with Christine, it doesn't take a long time to realize that you're talking to someone who knows a whole lot about designing usable web sites. As one of the most requested instructors at User Interface Engineering, she has worked with dozens of companies on their toughest web design problems. It would be very difficult to find someone who knows more about task design, user recruitment, and usability testing practices than Christine. She's regularly a top-rated presenter and keynote speaker at conferences all over the world.

Christine came to us from Fidelity Investments, where she was an influential member of their highly talented instructional design team. It doesn't hurt that she was one of the best students in Brown University's graduate psychology program. Did we mention that she taught Human Factors at the prestigious Tufts University Gordon Institute for Engineering Management?

David Brittan, Director of Publications (dbrittan@uie.com)

David Brittan is a journalist and editorial manager who specializes in bringing technical subjects to life for a wide audience. He has been an editor of such magazines as MIT's *Technology Review*, IBM's *Think Research*, and *Issues in Science and Technology*. His writing has appeared in *New Scientist*, *The New Republic*, *Ed.* (Harvard Graduate School of Education), *Contract Professional*, and many other publications.

Before entering journalism, David was an award-winning classical accordionist. He received a Bachelor of Music degree from San Diego State University and performed graduate studies in musicology at Harvard University.

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User Interface Engineering
4 Lookout Lane, Unit 4D
Middleton, MA 01949
(978) 777-9123 or (800) 588-9855 (within the U.S. and Canada)
www.uie.com

Company Background

User Interface Engineering is a leading research, training, and consulting firm specializing in web site and product usability. Jared M. Spool founded the company back in 1988 and has built User Interface Engineering into the largest research organization of its kind in the world. With our in-depth research findings based on user observation, we empower development teams to create usable web sites that increase customer satisfaction and loyalty.

Research

We conduct original research on all aspects of web site usability. In addition to our groundbreaking studies on the Scent of Information and Online Branding, we've identified best practices for creating e-commerce sites that increase bottom-line results.

Publications

If you are like every other web designer we've ever met, then you want to build the best possible sites you can. We've designed our UIE Reports to tell you everything we know about what it takes to create the best web sites.

Training Events

We offer the only research-driven, in-depth training courses designed to teach web designers exactly what it takes to build usable web sites and products. UIE offers training events designed for the entire development team. Topics cover how to design for web-site usability, designing for ROI, paper prototyping techniques, and tricks for including usability testing in the product design process. Events include:

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To answer these critical questions, we've found four of the world's most renowned experts on delivering successful content: Kate Gomoll, Ellen Story, Kim Goodwin, and Ginny Redish. This winter, we're bringing these four experts with us on the road for our third Roadshow, which we're calling Know Your Users. In this 3-day event, you'll have the opportunity to spend a full day with each presenter.

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