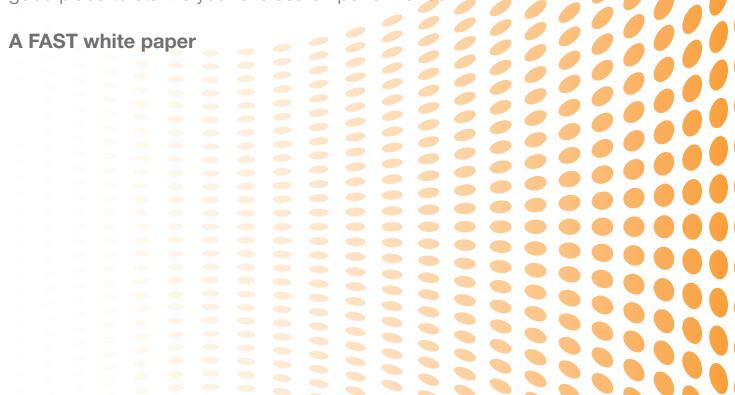# ::fast

The Importance of Performance in eCommerce Search

Peak shopping periods often expose performance problems in eCommerce sites. With the 2007 holiday shopping season right around the corner, it's time to evaluate the performance of your site. And since 50% or more of your holiday conversions will begin as a keyword search, a good place to start is your site search performance.

A FAST white paper

Introduction

Let there no longer be any doubt: eCommerce is for real. U.S. and European consumers spent more than $100 billion online in 2006. Nearly a quarter of those dollars and euros were spent during last year's holiday season, which jumped 26% year over year. And all this "e-growth" occurred in the face of lackluster in-store sales results.

But eCommerce news is not always good. For instance, a number of major eTailers suffered embarrassing, public site outages caused by the surge in online shoppers during the 2006 holiday:

- Wal-Mart.com was swamped by frenzied clickers responding to its TMX Elmo promotion.
- Costco.com bent under the pressure of desperate PlayStation 3 hunters.
- Amazon.com slowed to a crawl because of its $100 X-Box promotion.

As a result, millions of dollars were likely lost because these sites simply could not handle the load.

Holiday Season Retail E-Commerce in the US, November 1-December 31, 2005 & November 1-December 31, 2006 (billions and % increase vs, prior year)

November 1-December 31, 2005	$19.6
November 1-December 31, 2006	$24.6(26%)

Note: excludes travel, auctions and large corporate purchases
Source: comScore Networks Inc., January 2007

eMarketer.com

As the 2007 holiday season approaches, "performance" is undoubtedly a key topic for all major eTailers, whether they had performance problems or simply witnessed those of others. If you're an eTailer preparing for the upcoming holiday season, you need to be thinking about more than your server infrastructure or your hosting facility.

You need to be thinking about your search performance.

Why? Because search is becoming the storefront. Data shows that many of today's savvy, aggressive shoppers – particularly the ones intent on buying something – head right for the search box. And as more sites begin to power site navigation with search, even the "category browsers" are using the search engine. So if your site is up but your search is down, or slow, your competitor is a click away.

This paper examines the increasingly critical role site search performance plays in eCommerce. As you will see, a high performing search and navigation solution will not just help your shoppers find products quickly; it may just become the next differentiator in the increasingly crowded world of online shopping.

Search: The New Storefront

The way consumers find products to buy online is changing. A few years ago, shoppers bookmarked their favorite online shopping sites. After clicking through, they used static site navigation to find products. Keyword search was available on some sites, but the results were not always accurate or easy to navigate. And very few sites powered navigation with their search engines.

> *If your site is up but your search is down, or slow, your competitor is a click away.*

Today, the experience is radically different. Spoiled by the ease of use of Google and Yahoo, many of today's savvy consumers are slaves to the search box. Often it starts with a query on their browser's search toolbar. Instantly a list of retailers and price-comparison sites appears, with dynamic navigation based on price, brand and other attributes. When shoppers finally arrive at your site, they often know exactly what they want so it is natural for them to go right to the search box to find it.

Not convinced? Consider these data points:

- Multiple research studies have shown that 30% of online shoppers use eCommerce search outright.
- 30% of "browsers" switch to search when traditional site navigation fails.
- Among browsers who convert to buyers, 50% used search to find their purchases.

A key reason shoppers are switching from static site navigation to search is the flexibility of search results, which often include a dynamic list of product attributes that can be further explored. A recent retail consumer survey by Jupiter Research found that the ability to "refine search results by product attribute" was ranked the most useful of all eCommerce site features.

To capitalize on this shopping trend, many innovative eCommerce sites are beginning to power their entire site navigation with search. So the trend is clear: search is becoming the "front door" to your online storefront. If it is closed, buyers will go elsewhere.

The Importance of Search Performance

Since it is reasonable to conclude that most buyers touch your search solution at some point before they check out – either via the search box or through search-powered navigation – it naturally follows that your search performance should be as critical as site performance. But what should you be thinking about with regards to search performance?

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Most obvious and noticeable are the front-end benefits: reliability, speed and accuracy. Important, yes, but these are just the immediate benefits to the shopper. What you might not realize is that high-performance search also pays dividends on the back-end by helping you tune your shopping experience in real-time based on customer behavior, competitor activity and up-to-the-minute changes in your business data.

Let us explore these two dimensions of search performance and how each can help you create a more personal and profitable connection with each and every customer.

Search Performance: How Your Customers Benefit

Shoppers using eCommerce search and navigation expect three things: they expect it to work (reliability), they expect it to work quickly (speed) and they expect it to work accurately (relevancy). If one of these expectations is not met, jumping to a competitor is a click away. A high-performing search and navigation solution helps ensure that these expectations are fulfilled even under the most extreme conditions.

Reliability and Speed: Grace Under Pressure

The faster you can match a shopper with a desired product, the better chance they will convert. Conversely, a slow response to a search query or a delayed click on a search-powered navigator is a sure way to frustrate a customer. A recent study by Gomez revealed that more than 50% of shoppers said if a site loads too slowly they would turn to a competitor's site.

Extreme traffic spikes are the main culprit behind sluggish search and navigation. The aforementioned 2006 holiday season outages show what happens when thousands of users arrive at a site at the same time. For instance, second-hand accounts revealed that searches on Wal-mart.com during the holiday season Elmo surge were taking up to 45 seconds.

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Will AT&T and Apple experience the same issue with iPhones during the 2007 holiday shopping season? It is important to note, however, that traffic spikes are not limited to the eCommerce power-houses. A well executed promotion could generate a massive traffic surge on nearly any site – and this is a good thing!

Case study

One of Japan's largest e-Commerce portals (the "eBay" of Japan) is a great example of how a high performing search solution can excel even under the most extreme conditions. This online shopping mall includes 6 million items from more than 14,000 retailers. Amazingly, 10% of its inventory turns over every day – correlating to 500 product updates per second that must be cleansed and indexed by the search engine in near real-time. Peppering this massive, volatile search index are more than 3000 search queries per second. By implementing a high performance search solution, this eCommerce provider has been able to provide reliable, fast, accurate search results for its millions of users. And because its search solution features linear scalability on commodity hardware, it has reduced the total cost of ownership of its search servers by 66%.

The size of the search index can also affect search performance. A few years ago, most eTailers' search indexes consisted mainly of their product catalogs – SKUs, descriptions, images and other product information. But research indicates that providing other information, such as user reviews, within search results can increase profits. According to a study by Jupiter Research, "Shoppers who find user-generated reviews and ratings useful tend to spend more heavily online than average online buyers do." To capitalize on the trend, eCommerce sites have added user reviews, third-party product reviews, and multi-media (including video) to their sites. As a result, search index sizes have exploded, even for mid-tier retailers.

Most search engines cannot scale simultaneously under extreme traffic and across large indexes. High-performing search can efficiently distribute large indexes and major traffic surges without any degradation in performance. As a result, you can add new information to the site and run blockbuster promotions without worrying about the site search or navigation slowing down or crashing.

Relevancy: Keeping Your Data Fresh and Clean

Reliability and speed are meaningless if a search engine cannot provide relevant, precise results. Now, it is beyond the scope of this paper to examine all the factors that determine search relevancy. But two of these factors – data freshness and data cleanliness – are directly tied to the performance of the search solution.

Lack of data "freshness" is a main reason under-performing search engines fail to produce accurate results. To keep the index fresh, or current, the search engine must incorporate changes and updates in near real-time. If it cannot, the information a shopper is searching may be out of date. Take the example of the Nintendo Wii, an extremely popular product during the 2006 holiday season, but in short supply. If a shopper on a consumer electronics site searches for "Nintendo Wii," the "relevancy" of that result is tied to the freshness of the data index on the product. If the search index cannot incrementally update inventory in real-time, it cannot know that the last Nintendo Wii in stock sold out 15 minutes ago. So the shopper initially thinks the product in stock, only to find out at check-out that it is not.

Cleanliness is another factor that can degrade search relevancy. The index of an eCommerce site includes thousands of products, each with their own unique set of descriptors and attributes. "Dirty" data occurs when a product catalog has not been cleansed to reconcile the slight variants in product descriptions. For instance, various video game publishers may provide inconsistent product data to consumer electronics eTailers. Games for the X-Box system may be labeled X-Box or XBOX. A video game seeker who enters a query on X-Box may not receive any games labeled with XBOX. Search synonyms can be used to manually correct such problems, but impose extra work on merchandisers, slow down search query times, and cannot cover all potential dirty data conflicts.

Most eCommerce sites – particularly those with rapidly changing product catalogs – cannot keep their search indexes fresh or clean because they lack the ability to make incremental changes to the index in near real-time. A high-performing search solution, on the other hand, constantly cleanses and updates

the data index in real-time, including changes to the product catalog and back-office data like inventory – all while the system is running. The benefits? Your shoppers are presented with search results that are not only fast, but accurate. And your costs are reduced because you no longer need to make manual changes to keep your search solution up to date.

It is clear that a high-performing search solution provides tangible front-end benefits for your shoppers by improving reliability, speed and relevancy. But these benefits pale in comparison with the bottom-line benefits your business stands to gain.

Search Performance: How Your Business Benefits

The basic key-word search engines of yesterday have evolved into the intelligent information access platforms of today, which sit squarely in the mission-critical IT stack of serious eTailers. Instead of just delivering search results to shoppers, these platforms intelligently mine information from various sources that can be used to improve the bottom-line.

Consider the types of information that today's advanced search platforms can access and analyze:

- Every query on a specific word or phrase
- Every click a search navigator
- Every price-change made by a competitor
- Every positive review of a product you sell (on your site or someone else's)
- Every inventory change or price change in your back-office

High performance search solutions allow you to constantly tune your shopping experience based on real-time customer behavior, competitor activity and business intelligence data.

Make Decisions on a 360° View Of Customer Behavior

All serious eTailers have invested in a business analytics system to monitor browsing activity on their site. But as discussed earlier, as many as half of today's online shoppers eschew site navigation and use search (and resulting search navigation). So if you

base your site UI and promotional decisions solely on your static site analytics, these decisions may be uninformed.

Standard search solutions offer basic reporting on search keywords and navigators, but cannot integrate with site analytics data in real-time. With the ability to incrementally index data from nearly any system, high-performance search engines enable eTailers to simultaneously monitor search and site analytics to make decisions based on a 360° view of customer behavior.

Let us use the video game example. During the upcoming holiday shopping season, video game shoppers will again be looking for deals on the three major video game systems: the Nintendo Wii, Sony's PlayStation 3 and Microsoft's X-Box system. As shoppers search for holiday promotions and compare and contrast the three systems online, electronics eTailers have a key opportunity to monitor shopping behavior and tweak their sites to effectively cross-sell and up-sell.

An eTailer that makes its video game promotional decisions solely on site analytics is limited by the static pathways shoppers take to view information on the different systems. However, an eTailer with high-performance search can analyze site and search analytics simultaneously. The data might reveal that 40% of shoppers who search on X-Box also navigate to "Videogames" and "Superman Returns." Clearly X-Box seekers are also interested in the Superman Returns video game. This eTailer could then adjust its promotions in real-time to effectively cross-sell X-Box buyers the Superman video game, helping to increase average order values.

Boost Profits With Inventory-Based Merchandising

Most eCommerce search solutions provide search-based merchandising capabilities. For example, when a shopper searches on "diamond necklaces," they may be presented with a half-off promotion on diamond earrings. While "searchandising" has certainly helped increase average order values, it is just the tip of the iceberg. Extreme performance search takes dynamic merchandising to the next level by automating promotions based on real-time changes

to back-office data, such as inventory.

Going back to the video game example, a short supply of the Nintendo and Sony video game systems could present a difficult merchandising situation for electronics eTailers. Running a promotion on a system that is not in stock will frustrate buyers and erode loyalty.

An eTailer with high performance search, however, can rotate its promotions automatically as the inventory levels of each system change. When a small shipment of PS3s comes in, the search system can immediately pull the X-Box promotion from the site and replace it with a PS3 console/game bundle promotion to capitalize on the demand. The minute the last PS3 bundle is sold, the promotion can come down automatically and be replaced by the standard X-Box promotion.

By automatically triggering search-based promotions based on inventory levels, eTailers can boost profits by moving merchandise quickly and increasing average order values, and also build loyalty by ensuring promotions are always tied to in-stock products. All of this can be done without the need to involve the IT department, keeping operational costs to a minimum.

Thwart Competitor Discounting With Real-time Price Monitoring

Data from Forrester Research indicates that up to 50% of shoppers will always choose the site with the lowest price. In today's crowded online marketplace, if you cannot match your competitor's prices in real-time, you may be losing half the market.

Traditional eCommerce search engines are designed solely to deliver results to shoppers; they cannot monitor off-site data such as competitor pricing. High-performance search platforms, however, can deliver real-time pricing intelligence to your merchandisers, who can make immediate changes in response.

Once again we return to the video game example. As a slew of new video games hits the market prior to the holiday season, prices for each game will be very volatile. Staying competitive on game price is extremely important since game buyers represent

an opportunity for up-selling new consoles or accessories.

With a high-performing search solution, a merchandiser can create custom alerts to be instantly notified of competitor price changes on video games. With a few keystrokes, he can match or beat the price, assured that his change will be instantly reflected within site search results and navigation, as well as within the results of external price-comparison sites. The reason this is possible goes back to the ability of high-performance search to incrementally index changes to the product catalog and to back-office data in real time.

Integrated analytics, inventory-based merchandising, and real-time price analysis are just a few examples of how a high-performing search solution can directly increase your bottom-line. Others include search personalization based on "user profiles," dynamic recommendations, automatic indexing of user-generated content, geographical- and location-based merchandising, and more.

How Well Will You Perform in 2007?

The 2007 holiday shopping season is just around the corner. When the sun rises on Black Friday, will you be running around trying to keep your site up, or will you be reaping the benefits of your new high performance search solution? Remember, your marketers and merchandisers should be focused on doing their jobs, not worrying about crashing the site with the next blockbuster promotion.

FAST solution for eCommerce

The leading retailers and eTailers across the globe have partnered with FAST to power their next generation eCommerce sites with the industry's highest performing search and merchandising solution. Here are just a few reasons why:

1) Reliability & Speed: FAST is known for its scalable solutions. We power the word's most mission-critical eBusinesses. Robust, linear scalability ensures no degradation even during the most extreme spikes in traffic.

2) TCO Savings: FAST gives you better scale and performance using 3x to 5x less hardware. The easy operation saves maintenance headaches and cost. The common platform brings economies of scale.

3) True Real-time Merchandising: FAST unleashes the power of dynamic merchandising by integrating search-based promotions with constantly changing back office data – without the need to re-index or run batch processes.

4) Advanced Features: FAST is known for its search innovation and pioneering capabilities such as product catalog data cleansing, geo-search, mobile search, multi-media search, sentiment analysis, user-generated content integration, profile-based personalization and product recommendations.

At FAST, we are just as proud of customer-retention as we are of our industry-leading technology. We view each customer engagement as a partnership. Our global services organization will work with you to tailor your eCommerce solution specifically for your e-business and make sure that you are achieving a true return on your investment.

By choosing FAST, you will outperform the market in the 2007 holiday shopping season.

About FAST

FAST is the leading developer of enterprise search technologies and solutions that are behind the scenes at the world's best known companies with the most demanding search problems. FAST's solutions are installed in more than 3500 locations.

FAST is headquartered in Oslo, Norway and Needham, Massachusetts and is publicly traded under the ticker symbol 'FAST' on the Oslo Stock Exchange. The FAST Group operates globally with presence in Europe, North America, the Asia/Pacific region, South America, the Middle East and Africa. For further information about FAST, please visit www.fastsearch.com.

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