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Introduction

"The Trends & Observations in a Mobile and Connected World Report" was prepared by Keynote Competitive Research, the industry analysis group of Keynote Systems. This report contains high level observations on the trends and issues affecting the "Mobile and Connected World" in 2006.

The report includes highlights from the dozens of competitive research studies conducted by Keynote over the course of 2006, as well as the expertise of Keynote's industry analysts. The report examines leading online industries, including online retail, travel, financial services and search markets, as well as the Mobile Phone and Voice Over IP (VoIP) industries.

Keynote is the leading provider of on-demand test and measurement products for mobile communications, VoIP, streaming, and Internet performance. Keynote's mission is to improve eBusiness performance worldwide by providing metrics and insights into customer experience, operational excellence, and competitive strategies on the Web.

The competitive research studies referenced in this report are available for purchase.

The Internet in 2006

Overview: Brand Preferences Harden, Gaps Widen Between Competitors

In 2006, consumer brand preferences hardened, as the various Internet markets matured, making it increasingly challenging for competitor sites to usurp the leaders in their markets. Keynote's conclusions were drawn from the more than 24 studies the company conducted in the online retail, travel, financial services and search markets. Overall, the company examined more than 12 vertical markets and more than 50,000 online consumers as they interacted with 120 leading sites over the course of 2006.

Through year-over-year comparisons, Keynote found that, as the Internet matures, online brand preferences are hardening as consumers become more loyal and increasingly accustomed to the design and organization of their preferred sites. In mature Internet markets such as retail and travel, the Internet is starting to see the same types of consumer brand loyalty is observed in the offline world.

It is important to note that brands were also solidifying for the second and third-ranked sites in a market, not just with the leading sites. This means it will become increasingly challenging to steal customers from competitors (other leading brands), and increasingly challenging to usurp the leader in a market. Future online market share growth will more readily come from an expanding online population and from customers frustrated with their online experience at competitor sites, than by luring customers from other top-tier brands.

Top Internet Trends in 2006

- 1. Hardening Brand Loyalty:** Consumers becoming more inclined to stick with their preferred brand than switch to a competitor site.
- 2. Rising Expectations:** Increasingly high expectations from consumers for a satisfying online customer experience.
- 3. Desire for Specialization:** Consumer expectation and demand for specialized and personalized services on leading Web sites.

Top Web Sites in 2006

The leading Web sites in a dozen Internet markets are listed below. These leading sites were determined through the Keynote Customer Experience Rankings, a series of syndicated research studies for which Keynote examines the online experience consumers as they browse, search, shop and generally interact with leading retail, travel and financial services Web sites.

For each vertical industry, Keynote typically examines 2,000 consumers as they interact with the 10 leading websites in a specific vertical market. Keynote measures more than 250+ metrics for each site included in its studies, including metrics gauging ease of use, customer satisfaction, brand appeal and customer acquisition impact. The sites in the specific vertical are then ranked in a number of categories, and a leader in each market is determined by site performance across all metrics and categories examined in the study.

A series of companion studies, the Keynote WebExcellence Scorecard, measure and rank Web sites for online excellence according to their use and execution of 225+ industry best practices. Those studies are based on the collection of more than 8,000 pieces of competitive data for each of sites included in the study.

Highlights of the rankings and trends in each vertical industry are provided below.

Top Web Sites in 2006: Keynote Customer Experience Rankings

Retail	Top Web Sites
Books & Music	Amazon.com
Electronics	Amazon.com and Circuit City
Apparel	L.L. Bean
Computers & Hardware	Amazon.com and Dell

Automobiles	Top Web Site
Luxury Auto	Cadillac and Lexus

Travel	Top Web Sites
Airline & Hotel	Expedia
Rental Car	Travelocity and Budget
Cruise	Travelocity and Royal Caribbean

Financial Services	Top Web Sites
Banking	Citibank and Bank of America
Brokerage	Fidelity
Credit Card	Discover and American Express
Auto Insurance	Progressive

Search	Top Web Site
Search	Google

The full Keynote Customer Experience Rankings studies contain hundreds of metrics and additional information not only identifying the best and the worst Web sites in certain categories, but also providing specific detail about why the sites ranked where they did.

The Internet in 2006: Service Levels

Overview: A Class System Established, A Widening Gap

In 2006, Keynote also observed a class system developing in terms of the service levels, or the reliability and responsiveness of sites on the Web. Keynote's conclusions about service levels were drawn from the more than 24 studies the company conducted in leading online industries for which it collected more than 6,500 data points for each of more than 120 leading sites over the course of 2006.

Leading sites in mature Web industries—including financial services, retail, travel and search—have average availability of 99.9%, meaning they have virtually no downtime nor significant slowdowns. The top two or three sites in any mature Internet industry will report this high level of availability, whereas other sites in an industry report decreasing reliability and responsiveness.

The best sites in a given market are virtually always available and experience almost no slowdowns or errors. Whereas the second-class sites on the Web are experiencing major outages and slowdowns during peak periods, as evidenced by the problems

a handful of major retail sites saw on Black Friday in 2006. (See related Keynote report on online service level performance during the 2006 Holiday Season.)

Keynote has been regularly measuring service levels on the Web since 1998, and 2006 marked the first time that the Internet as a medium clearly reached service and reliability levels comparable to utilities such as phone, electricity and cable television services. As opposed to in year's past, virtually all errors and slowdowns that consumers experience today are the result of the poor planning or infrastructure of the specific Web site owner, as opposed to those of the Internet infrastructure.

Keynote research shows that consumers now expect almost perfect service from the Internet and the sites they use online. Their expectations of Web sites are comparable to their expectations for phone and cable television service: they expect them to always be on.

Keynote said the retail and financial services industries continue to have the best performing sites in terms of service levels, although even those industries have their poor performing sites.

Top Sites in 2006: Service Levels

The leading Web sites in 2006 in terms of service levels are listed below. These leading sites were determined through the Keynote Service Level Rankings, a series of syndicated research studies for which Keynote examines the technical performance of leading sites, including site responsiveness and reliability.

For each vertical industry, the Keynote Service Level Rankings measure and monitor site performance typically for a one-month period, collecting more than 6,500 data points for each site and then ranking the sites across 40 performance metrics. The top sites in an industry perform best, in aggregate, across all data points and performance metrics captured in a study.

Highlights of the rankings and trends in each vertical industry are provided to the right.

Top Web Sites in 2006: Keynote Service Level Rankings

Retail	Responsiveness	Reliability
Books & Music	Borders	Target
Electronics	Circuit City	CDW
Apparel	Kohls	JC Penney
Computers & Hardware	CompUSA	Sony

Travel	Responsiveness	Reliability
Hotel	Marriott	Marriott
Cruise	Celebrity	Celebrity

Financial Services	Responsiveness	Reliability
Banking	Bank of America	Bank of America
Brokerage	E*Trade	E*Trade
Credit Card	US Bank	American Express

Search	Responsiveness	Reliability
Search	Google	Google

The full Keynote Service Level Rankings reports identify the best and worst sites in the market in terms of reliability and responsiveness, as well as dozens of other categories, such as broadband speed and responsiveness. The study offers into technical performance relative to competitors, and provides detailed data on site performance across seven key measures critical to the operational health of an online computer hardware site. Specifically, the study provides performance data and competitive rankings in both site reliability, including site availability and outages, and site responsiveness, including load handling, response time consistency, geographic consistency and responsiveness over both high-speed (DSL) and low-speed connections.

Top Internet Service Level Trends in 2006

- 1. Service Level Class System:** A class system has been established on the Web, with the best sites performing at 99.9% availability, and second-class of sites performing at much poorer levels, causing outages and slowdowns during peak periods, such as Black Friday.
- 2. The Broadband Migration:** An increasing majority of sites are being designed primarily for broadband users, with page weights and functions virtually unusable for narrow-band or dial up customers.
- 3. Continued Increases in Volume:** Traffic and page volumes on the Web continue to rise and raise demands on site operators to improve their infrastructure.

Mobile Services in 2006

Overview: Data Usage, Consumer Expectations Rise

In the Mobile Services Market in 2006, consumers' demands and expectations continued to rapidly rise for services such as mobile messaging, e-mail, music, photos and streaming video. Although the technologies and markets for these services are not fully developed, consumer expectations were, nonetheless, very high.

Driven by the heavy advertising and consumer experience with other technologies, consumer expectations for mobile service quality is at a very high level, comparable to expectations for computer driven access to the Web, gaming and video. Mobile services companies face a challenge in 2007 to manage or match these soaring consumer expectations.

While the growth over the past few years has been driven purely by the growth in the number of mobile phones in use – and competitive focus has been on delivering the best marketing, network and voice packages in the market – in 2006 mobile data services have emerged as a significant factor in the market both in usage and revenue growth.

The number of mobile phone subscribers adding Web or data services skyrocketed in 2006, with Verizon adding more than \$1 billion in revenue based on mobile Web and data services— and more than \$3 billion in games downloaded globally in 2006. The demand for mobile e-mail in business circles— and cultural and entertainment phenomenon, such as text message voting during the American Idol program, will continue to fuel the growth of such services.

Top Mobile Service Trends in 2006

- 1. Rising Consumer Expectations:** The rise of consumer expectations to the point where they expect mobile quality to match land line quality—and they expect mobile data services to match the quality of those services as delivered by a PC or laptop on a broadband connection.
- 2. The Rise of Data Service:** The skyrocketing demand for Web and data service via mobile phones including e-mail, text messaging, gaming and video streaming the porting of Web applications and services to mobile .

Voice Over IP (VoIP) in 2006

Overview: Demand for Cable VOIP Booms, Challenged by SoftPhone

In the Voice Over IP (VoIP) market, the biggest issues in 2006 were the boom in demand for VoIP services, the continued emergence of cable as the dominant market force, and issues related to the quality of VoIP services that are keeping even larger numbers of consumers from turning to VOIP.

In 2006, a large and growing number of consumers were willing to give the technology a try. VoIP has entered the mainstream as an acceptable means of voice communication with the US VoIP customer base increasing from approximately 1.3million subscribers in 2004 to more than 7 million in 2006. Traditional analog telephony still has more than 132 million subscribers in the U.S. However, currently, more than 100,000 traditional land phone lines a month are being replaced by VoIP services.

Traditional voice services providers over Public Switch Telephone Networks (PSTNs) are facing increased challenges from Analog Telephone Adapter (ATA)-based VoIP providers such as Verizon, EarthLink and Vonage. However, both types of voice communication providers are going to be under pressure from the growing base of PacketCable providers (Internet telephony service over the cable network) such as Comcast and Time Warner, and SoftPhone providers such as Skype.

The PSTN providers and Vonage will be challenged principally by the quality of service that cable companies provide and by the ease of switching to VoIP that SoftPhone providers such as Skype can deliver

The primary consumer hesitation in switching to VoIP is a concern that the quality will not match land-line service. Keynote's measurements show that cable providers consistently record the best VoIP phone service quality, providing a level of quality comparable to land line service. Most VoIP services require hardware installation, whereas the newer SoftPhone providers simply allow consumers to download VoIP software to their computers over the Internet, shortening the time to receive service and providing a key competitive advantage. Leading Internet companies such as Yahoo!, MSN and Skype have entered the SoftPhone market.

The big challenge for VoIP companies in 2007 will be retaining their customer bases – and protecting and advancing the reputations of their services. All this rests on the consumer's perceptions of the quality of service.

Consumers as a whole are still in the very early stages of learning and assessing VoIP services, the experience of the early adopters will have a tremendous impact on the direction of this market in the future.

Measuring VOIP Quality

To determine the leading providers and categories of providers for VOIP service in 2006, Keynote measured Voice Service Quality for a dozen providers over a one-month period, placing more than 125,000 phone

calls and sending audio samples over those lines. The study tested audio quality, including clarity and responsiveness and audio delay, as well as the overall reliability of the services.

Of the service providers measured in previous studies, seven had a better service availability percentage in 2006 than in any previous Keynote study in 2005. The Non-PSTN voice services industry has just a 99% service availability average, meaning that one out of every hundred calls placed on these services would not be connected, a level unacceptable to mainstream consumers.

The majority of providers measured an average audio delay above 150 milliseconds, again an unacceptable level of delay for the mainstream consumer population. However, four providers, were able to demonstrate consistent quality levels above a threshold considered quality audio levels by mainstream consumers. The best average audio delay was just 62 milliseconds, virtually unnoticeable and comparable to standard land line phone lines.

In terms of the quality of calls, only four of the providers measured had an average mean observable audio quality score above the 4.0 threshold.

VoIP Service Providers had a higher variation between primetime and non-primetime hours in audio delay than in Mean Opinion Score. DSL connections delivered more consistent primetime versus non-primetime hour audio delay performance, but cable modem connection delivered more consistent Mean Opinion Scores.

Most VoIP service providers still have many calls with temporal clipping or audio holdover causing service degradation. PacketCable service providers had superior Reliability and Audio quality performance.

To determine the leading providers of VOIP service in 2006, Keynote measured Voice Service Quality for 14+ providers over a one-month period, placing more than 125,000 phone calls and sending audio samples over those lines. The study tested audio quality, including clarity and responsiveness and audio delay, as well as the overall reliability of the services.

The full Keynote VOIP Competitive Research Report ranks the relative performance of 14 leading PSTN, PacketCable, VoIP hard phone, and VoIP soft phone service providers. The report identifies industry trends in service level performance; the full range of performance levels for the best and worst service providers, and examines peak and prime-time performance variations. The full report also identifies the strengths and weaknesses of each service provider and voice service technology.

Top VOIP Providers in 2006

To determine the leading providers of VOIP service in 2006, Keynote measured Voice Service Quality for [xx] providers over a one-month period, placing more than 125,000 phone calls and sending audio samples over those lines. The study tested audio quality, including clarity and responsiveness and audio delay, as well as the overall reliability of the services.

The full Keynote VOIP Competitive Research Report ranks the relative performance of [14] leading PSTN, PacketCable, VoIP hard phone, and VoIP soft phone service providers. The report identifies industry trends in service level performance; the full range of performance levels for the best and worst service providers, and examines peak and prime-time performance variations. The full report also identifies the strengths and weaknesses of each service provider and voice service technology.

Video Streaming in 2006

In video streaming in 2006, Keynote reported that the continuing growth in broadband adoption led to an increase in social web applications and a furious growth in the availability of video. The majority of growth in the streaming video market was driven by user generated content, but there were ample examples of traditional media companies experimenting with delivery of their programming.

Keynote analysts predicted that consumer developed video will continue to drive streaming growth in 2007, but next year will see media and Internet companies produce higher quality video and niche programming

aimed at augmenting the TV viewing experience. The increased distribution of video content will also fuel growth in peer-to-peer platforms as legitimate mechanisms for delivering streaming media.

Consumers, through social networking sites such as YouTube, drove the growth and popularity of streaming video in 2006, but traditional media companies are beginning to focus seriously on this medium and market. Collaboration between content owners, advertisers and manufacturers will provide a new array of offerings to a wider set of audiences.

The video ad market will also be radically impacted by the growth of the streaming market – and revenue models associated with delivery of video ads will also mature. Increased user control of content will require a higher level of interactivity and creativity with video ad campaigns.

Top trends in video streaming:

1. Explosion of Consumer Driven Content: The explosion of consumer developed content and the rise of social networking sites such as MySpace and YouTube.

2. Media Companies Increase Quality: As the streaming video market expands beyond the tech-savvy/early adopter stage, media companies will dedicate more resources to streaming content, and the quality of the viewing experience will need to match expectations that have been set by traditional television.

The Internet: Online Customer Experience and Service Levels

The Retail Industry

In the online retail industry, Amazon.com topped the Keynote Customer Experience Rankings in both the electronics and books & music retail markets. The Keynote Customer Experience Rankings are an overall measure of customer experience and customer satisfaction across the more than 250+ metrics measured in the Keynote study of the online retail Industry.

The study found that Amazon's success was driven in part by its visual appeal, clear design and organization and because consumers were highly satisfied with the site's product search function. Because of its success in these areas, Amazon.com also topped the Keynote Conversion Index, an indication of how effectively a site converts online browsers into online buyers.

L.L. Bean topped the Keynote Customer Experience Rankings in the apparel retail market sector based on consumer satisfaction with its product offering, as well as overall search and purchase process satisfaction. L.L. Bean also topped the Keynote Conversion Index in the apparel retail market.

As far as service levels in the retail industry, Circuit City in the electronics category; Borders in the books & music category; and Kohls in the apparel category were the top sites in terms of site responsiveness, an indication of how fast the sites were in downloading pages and executing transactions. CDW in the retail electronics category; Target in the books & music retail category; and J.C. Penney in the apparel category had the industry's best reliability, indicating those sites were highly available and experienced little or no downtime, according to the Keynote Service Levels Rankings study.

The Keynote Service Level Rankings study for the online retail industry reported that, in part because traffic load has increased significantly over the past year, many retail sites were not well prepared for the peak season loads. Some major retail sites are having difficulty staying up to industry standard 99.5% availability, and many sites are experiencing small outages.

Further detailed rankings, data and analysis are available in the full Keynote studies for the online retail industry, which are available for purchase.

Online Banking

Citibank was ranked as the #1 site in the *Keynote Customer Experience Rankings for Banking Web Sites*, with the best overall ranking across the 250+ customer experience and customer satisfaction metrics measured in the study. As a result of its strong overall performance, Citibank was also ranked as the best site at acquiring new customers online.

Bank of America was ranked as the #1 site among all online banking sites in the *Keynote WebExcellence Scorecard for Banks*, performing best, in aggregate, across all 300+ industry best practices for site functionality evaluated in the study. The Citibank site ranked second in the *Keynote WebExcellence Scorecard* study.

Bank of America and Citibank both performed very well in both the *Keynote Customer Experience and the Keynote Scorecard* studies, indicating both had strong performance in implementing best practices and in the customer feedback they received. Keynote recorded strong evidence that this success translates into success in acquiring customers online.

Bank of America also ranked #1 in the *Keynote Service Level Rankings for Banking Web Sites* in both the overall site responsiveness and reliability categories. Bank of America and Citibank had the industry's best reliability, indicating those sites were highly available and experienced little or no downtime – and Bank of America had the industry's best site responsiveness, an indication of how fast banking sites were in downloading pages and executing transactions.

Further detailed rankings, data and analysis are available in the full Keynote studies for the online banking industry, which are available for purchase.

Credit Card

Discover, American Express and Chase topped the Keynote Customer Experience Rankings, an overall measure of site success across the more than 250+ metrics measured during the its study of the online credit card industry. Keynote also ranked the sites in more than a dozen subcategories including customer satisfaction, customer acquisition and brand affinity, as well as functions such as ease of applying for a card online.

Discover was the top site in terms of the online customer experience based on its leadership position in credit card satisfaction, an indication of consumer satisfaction with its interest rates and fees as compared to other leading cards. Discover was also considered the easiest credit card to apply for online—and the easiest company to deal with, with almost two-thirds (71%) of online consumers expressing this sentiment.

American Express was considered the “high value” and most “trustworthy” brand by online consumers, and made exploring online services easy for prospective card customers. The American Express site also ranked highest in satisfaction in the area of online services offered. Chase performed well based in part on its leadership in the area of customer support and overall credit card satisfaction.

The Keynote evaluation of customer acquisition success determined that those sites providing the best online site experience also performed well in attracting new customers. Chase and American Express were joined by Citi in topping the Keynote Customer Acquisition Index, which measures which sites are doing the most effective job of acquiring customers online.

Approximately 30% of prospective customer visiting the Chase, Citi and American Express sites indicated they were very likely or extremely likely to sign up for a credit card account with those companies. Comparably, the bottom ranked sites registered only 16% of the prospects visiting their site as being interested in a card.

More than half (52%) of study participants indicated that online account management services were very important or extremely important in their selection of a new credit card account. This represents a close to 8% increase in the number of online consumers indicating online account management as an essential factor in their card selection considerations, as compared to just a year ago when Keynote last conducted its study. Only 8% of online consumers in the study said that online account services were not very or not at all important in their selection process.

Consumers also are increasingly interested in cash-back programs offered by credit card companies, with 39% of online consumers expressing an interest in these programs, almost on par with the 41% who consider travel rewards programs a key factor in their card selection process.

The Keynote Service Level Rankings for Credit Card Web Sites found the HSBC, Providian and Wells Fargo Web sites to have the industry's best reliability, indicating those sites were highly available and experienced little or no downtime. HSBC and Providian were also the industry's best in terms of site responsiveness, an indication of how fast the sites were in down loading pages and conducting transactions. Chase was also a leader in terms of site responsiveness.

The credit card industry demonstrated excellent reliability, averaging 99.3% reliability for the top sites, and with HSBC reporting 99.9% average reliability. However, a handful of credit card sites did record significantly worse reliability, with one site experiencing 25 hours of outages during the month long evaluation period.

The industry seems to be gearing its business primarily toward broadband users, and service for high-speed users was excellent with average page downloads of just 1.7 seconds, with MBNA and Wells Fargo loading in under 1 second. However, performance for dial-up users was just “mediocre” according to Keynote, with page downloads averaging almost 30 seconds. Ironically, the slowest performance for dial-up users was during the account application process.

A large number of sites showed inconsistent performance, with performance spiking and plunging during different periods, indicating general instability in their infrastructure and hosting environment, something atypical in the financial services industry.

Further detailed rankings, data and analysis are available in the full Keynote studies for the online credit card industry, which are available for purchase.

Brokerage

The online brokerage industry is clearly among the most competitive on the Web—and the shifts Keynote observed in the industry in 2006 demonstrate that leadership and market share are tenuously held in this competitive market.

Highlighting the competitiveness in the market, Fidelity and Scottrade provided prospective customers with the best online experience, beating out E*Trade, which had topped the study last year. Despite being edged in customer experience, E*Trade still ranked as one of the best sites at acquiring brokerage customers online—and atop the service level rankings which measure site reliability and responsiveness. And although prospective customers reported being more satisfied with the products Fidelity offered, they also reported being happier with the online features at Scottrade and Merrill Lynch.

In the online brokerage industry, no one site is winning across the board. Some sites perform well in terms of product satisfaction, some in terms of providing strong online features, and still others in terms of online customer acquisition. In other online financial services industries Keynote studies, there is more stability in the competitive rankings, and the leaders overall tend to also lead in multiple categories.

Keynote also reported wide ranges in prospective customer satisfaction with online brokerage sites. Although as many as one in five (19%) prospective online brokerage customers express dissatisfaction with the product offering, often because of confusion about fees and commissions, the best sites record

85% satisfaction. On one major brokerage site, more than 27% of prospective customers visiting the site expressed frustration at the clarity of information on fees and commissions. Three well-known sites received excessive complaints from prospective customers regarding their online trading demo, with specific complaints about problems locating the demo. At these sites, close to 3 in 10 visitors (29% to 31%) expressed such frustration.

The *Keynote Customer Experience Rankings for Brokerage Web Sites* study measured more than 250+ metrics for each site and determined industry leaders in terms of prospective customer satisfaction, brand appeal and customer acquisition success, as well as ranked the sites in more than a dozen different categories including product satisfaction, online features satisfaction and ease of opening an account.

Fidelity, Scottrade and Schwab topped the Keynote Customer Experience Rankings, an overall measure of customer experience across the 250+ metrics measured in the study. Fidelity and Scottrade were joined by E*Trade atop the *Keynote Customer Acquisition Rankings*, an overall measure of effectiveness in customer acquisition.

The *Keynote Service Level Rankings for Brokerage Web Sites* examined the technical performance on the public pages of leading brokerage Web sites including overall site responsiveness and reliability by simulating 6,500 interactions with each site over a 30 day period. E*Trade, Ameritrade and Sharebuilder had the industry's best reliability, indicating those sites were highly available and experienced little or no downtime. E*Trade and Ameritrade were joined by Merrill Lynch as the top sites in terms of site responsiveness, an indication of how fast the sites were in downloading pages and executing transactions.

Overall performance in the brokerage industry is strong as compared to other financial services industries, and has improved in some areas over the past year. For instances, average page download times over broadband connections improved by approximately 6% in the past year.

The industry also saw competitive shifts over the year, with E*Trade dominating the service levels in the industry in 2006, moving up from just an average showing in 2005. There were also large gaps between the best performers and worst performers, with top sites available 100% of the time during peak measurement periods, as compared to poorer sites that were available less than 96% of the time. Several sites had major reliability issues, with one site unable to take online applications for more than 110 peak hours during the 30 day evaluation period. Another major brokerage company showed daily slowdowns of 45% during peak periods, indicating that the site could not handle the volume of users coming to its site without noticeable slowdowns in page download times.

Further detailed rankings, data and analysis are available in the full Keynote studies for the online brokerage industry, which are available for purchase.

Travel – Hotel

In Keynote's annual examination of the hotel industry, customer satisfaction rates were down sharply—and frustration levels were climbing—across the online travel and hotel industry. The Keynote study noted that satisfaction levels dropped during a period when many leading online travel agency and hotel sites completed site makeovers. One leading travel agency site saw its customer satisfaction rates drop from 73% in 2005 to just 62% in 2006. Another leading hotel site saw its high satisfaction rate drop from 66% down to 55% over the same period.

Keynote said that consumers appear to be “a bit grumpy” with the online travel agencies and hotels sites in 2006. It appears the changes and makeovers many leading sites made to their Web sites, and specifically to their homepages, may have negatively affected customer satisfaction.

Expedia edged out Travelocity in the Keynote Customer Experience Rankings, an overall measure of customer experience and site success across the more than 250+ metrics measured during the

Keynote study of the online travel and hotel Web sites. Expedia outpaced the competition based on its continued strong performance across all areas of site performance and its clear leadership in consumer perceptions about the quality and value of the available hotel accommodations on its site.

However, Travelocity, bucked the industry-wide trend in falling customer satisfaction ratings and actually registered improvements in its overall customer satisfaction and customer experience rates, placing second overall in the Keynote Customer Experience Rankings. Travelocity was boosted by its customer support and travel guarantees which resonated well with consumers. The site also was rated as having the best online booking process.

Hotels.com was one of the only sites to actually see improvements in customer experience ratings based on changes made to its site. Hotels.com streamlined its online booking reducing the process to a simpler three-step format. The site climbed from the cellar of the online travel industry in terms of booking process satisfaction to the second-ranked site in the category after Travelocity. In 2005, just slightly more than half of visitors to Hotels.com said the site's booking process was easy to use, as compared to 78% who stated that in the 2006 study.

The *Keynote Service Level Rankings for Lodging Web Sites* found the Marriott, Priceline and Sheraton sites have the industry's best reliability, indicating those sites were highly available and experienced little or no downtime. Marriott and Sheraton were also the industry's best in terms of site responsiveness, an indication of how fast the sites were in downloading pages and executing transactions. Expedia was also a leader in terms of site responsiveness.

Overall, the online travel and lodging industry had one of the lowest reliability ratings on the Web as compared to the other industries Keynote studies. Only 2 of the 10 sites studied were available better than 99% of the time, which is the threshold reliability rate recommended by Keynote for most industries. The online travel industry had an average closer to 97% reliability, meaning that an average of 3 out of 100 visitors experience significant

site problems or failure. Overall, the hotel sites had greater reliability and responsiveness than did the online travel agency sites, and some leading online travel agency sites were the slowest of all hotel and online travel sites.

Further detailed rankings, data and analysis are available in the full Keynote studies for the online travel and hotel industry, which are available for purchase.

Travel – Airline

Orbitz, Travelocity and Expedia were ranked as the leading sites in the online travel and airline industry based on the *Keynote Customer Experience Rankings*, an overall measure of online customer experience based on evaluation of more than 250 metrics for each of the 16 sites in the study.

The online travel agency sites, such as Orbitz and Travelocity, dominated the study ranking ahead of all airline sites in terms of customer satisfaction and customer acquisition success. The agency sites' success is driven by their strong lead helping customers search for a flight and in perceptions of flight availability and price satisfaction. In fact, after price, the ability to compare flights across carriers was the most important factor for online consumers searching for a flight, with 61% of online consumers saying this was a key consideration. Less than half of all airline site visitors (49%) described those sites as "helpful" in their flight search and booking process, whereas an average of 67% of visitors to leading online travel agency sites described them as helpful.

On a similar basis, Orbitz edged out the competition based on its online flight search and booking process, as well as positive perceptions about flight availability and prices on the site. Expedia, which has consistently been the pace setter in the online travel industry, also performed strongly in ease of finding a flight and flight availability. Expedia has received the top customer experience ranking in Keynote studies of the travel planning, cruise, hotel and lodging industries, as well as the previous airline industry study. Expedia also garners the highest industry brand perceptions according to Keynote studies.

Excluding travel agency sites, Southwest, American and JetBlue were the leading airline sites in terms of both the online customer experience and customer acquisition success. This marks the second consecutive year in which Southwest led all airline sites, and marks a significant improvement in performance for the American Airlines Web site. Southwest and JetBlue were the only airline sites to closely compete with the online travel agency sites in terms of price satisfaction.

When consumers have a positive online experience, it typically increases their perceptions of the overall brand, and Keynote reported that online travel and airline sites universally saw significant brand reputation increases based on the customer's online experience. One leading online travel agency site saw its positive brand perception double from just 30% before the prospective customers used the site to 70% positive brand perception after their online experience.

Across the board, consumers have seen improved flight search and online booking processes at online travel agency and airline Web sites, with as many as seven sites improving dramatically in these areas. Airline site improvement in the online booking process was driven by factors such as reduced registration requirements and simplification of Web forms.

Further detailed rankings, data and analysis are available in the full Keynote studies for the online travel and airline industry, which are available for purchase.

Travel – Cruise

Travelocity, Royal Caribbean and Expedia topped the *Keynote Customer Experience Rankings*, an overall ranking based on performance across all 250+ metrics measured in the *Keynote Customer Experience Rankings for Cruise Web Sites*. The study also determined the top performers in terms of customer satisfaction, brand appeal and customer acquisition success, as well as the leaders in more than a dozen different categories including ease of online booking, cruise activity research, and accompanying flight and lodging research.

Travelocity, Royal Caribbean and Expedia also led in the rankings for some of these key categories, including for the online booking process, customer support and the cruise research categories. Success in these core areas also translated into success in customer acquisition indicators as well.

The Princess cruise Web site showed significant improvement across the board and specifically in the brand and customer acquisition rankings, based on the addition of a section of their site which allows visitors to compare cruise options.

As was the case in past Keynote studies of the cruise industry, the online travel agency sites, such as Travelocity and Expedia, tend to perform better in terms of customer experience and customer satisfaction as compared to the cruise company sites. However, the cruise sites, such as Royal Caribbean and Princess, tend to perform better in terms of cruise activity research. Keynote analysts note that this is a competitive advantage that cruise companies should leverage.

Almost a third (31%) of all visitors to cruise sites expressed a desire for more—and easier access to—information about cruise activities. And a Keynote analysis showed a strong correlation between a customer's satisfaction with a site's cruise activity research and its success in influencing customers to book a cruise in the future, whether online or offline. The Royal Caribbean, Princess and Carnival sites were the best in the industry in terms of cruise activity research.

Keynote analysts also noted that the cruise industry could benefit from following the trend in other online travel industries towards simplifying or eliminating visitor registration. Almost half of all visitors (47%) to some cruise sites reported frustration with forced or lengthy registration processes.

The *Keynote Service Level Rankings for Cruise Web Sites* examined the technical performance of leading cruise and online travel Web sites, including overall site responsiveness and reliability, by simulating 6,500 interactions with each site over a 30 day period. The Celebrity, Cheap Tickets and Royal Caribbean

sites had the industry's best reliability, indicating those sites had the least errors of all the sites in their industry. Celebrity, Travelocity and Expedia were the top ranked sites in terms of site responsiveness, an indication of how fast the sites were in downloading pages and executing transactions.

However, the cruise industry as a whole is not performing to the same standards as other travel industry Web sites according to Keynote, with a majority of cruise sites and the cruise sections of online travel sites experiencing availability and load handling issues. A majority of sites examined in the study also recorded site outages, where the site was unavailable to visitors. These outages ranged anywhere from 6 hours to a maximum of almost 48 hours during the 30 day evaluation period. The majority of sites also experienced temporary availability issues, such as when a page would not download. On average, 1 out of every 20 visitors to a cruise site had such a site or page availability issue which would have prevented them from completing the research or booking process.

Keynote noted that other industries, such as the luxury auto industry, that also have sites with extensive visual images, do not have the same technical problems, so an important opportunity for improvement exists.

Further detailed rankings, data and analysis are available in the full Keynote studies for the online travel and cruise industry, which are available for purchase.

Computer Hardware

Amazon was ranked as the #1 site in the *Keynote Customer Experience Rankings for Computer Hardware Web Sites*, with the best overall ranking across the 250+ customer experience metrics measured in the study, as well as for its #1 ranking in terms of customer satisfaction and brand affinity. Dell was ranked as the best site overall in terms of online customer acquisition, and was ranked second overall in terms of the overall online customer experience.

Sony and CompUSA ranked #1 in the *Keynote Service Level Rankings for Computer Hardware Web Sites*. Sony had the industry's best reliability, indicating the site was highly available and experienced little or no downtime. CompUSA had the industry's best site responsiveness, an indication of how fast computer hardware retail sites were in downloading pages and executing transactions.

Several leading computer hardware retail sites examined in the study recorded major site outages, where their sites were unavailable to visitors for more than 40+ hours over the one month evaluation period. According to Keynote, the industry average for site outages is just 2 hours in a 30 day period across the computer hardware industry. Also, many of leading computer hardware sites showed slower than average broadband performance due to the increasingly complex pages offered up to consumers.

Further detailed rankings, data and analysis are available in the full Keynote studies for the online computer hardware sales industry, which are available for purchase.

Search

In 2006, for the fourth consecutive wave of the Keynote study of the search industry, Google topped the Keynote Customer Experience Rankings, an aggregate ranking of leading search engines based on an analysis of 250+ metrics measured during the study. In fact, Google outperformed its competitors in all 13 business success drivers measured in the study, including those for general search quality, local search quality and image search quality.

Yahoo! Search ranked second in the study, Ask Jeeves third, MSN fourth and AOL's public site ranked fifth. The study ranked the public sites of each search engine in 13 different categories based on their performance with the general Internet population. The AOL Search subscriber site, the site dedicated to its subscribers, was also tested, and would have ranked third in these rankings. In fact, all search sites perform better with their frequent or regular users.

However, only AOL has a separate site for those regular users, thus for comparison purposes only the AOL public site was ranked.

Yahoo! demonstrated its staying power in the latest study, holding its ground with Google, and posting a clear lead over its other competitors. Yahoo! remains in second place across 12 customer experience drivers measured by Keynote, including those for general and local search quality. However, Yahoo! performs most competitively with Google in the local and image search categories. When searching for local services or information, 82% of Yahoo! users reported task success, as compared to 83% of Google users, and 66% of Yahoo! users were very satisfied with their search as compared to 71% of Google users.

Industry experts expect new areas of search to help drive even greater usage of search sites in the future. In the last few years all five of the major sites have introduced "local" and "image" search tabs on the main navigation bars of their sites.

Image search appears to have caught on quite quickly with consumers, with 63% of Yahoo! users and 56% of Google users turning to the image search areas of those sites when searching for an image. There is less awareness and usage of the local search tabs, with just 28% of Google users and 39% of Yahoo! users in the study turning to the local search function when conducting a local search although there is great appreciation for Google's integrated local search results. There is significantly less consumer demand for the special product search functionality on all leading sites.

General search quality still has the greatest impact on the user experience for search engines. Ask Jeeves showed the largest increase in general search quality over the last year, while MSN had the largest improvement in this area in the past six months.

Despite the difference in perceived quality of search results, actual search quality differs little among the primary search engines. The latest Keynote study reconfirms those previous findings, and again demonstrates that Google and Yahoo! generate much of their satisfaction from additional factors aside from actual search quality.

The difference between the sites in terms of customer experience and customer satisfaction among their regular or primary users is relatively small as compared to the wide differences between the competitors among new users or infrequent users who do not have a primary search engine. For instance, among new and infrequent search engine users, 82% of those sent to search on Google were “very satisfied” with their experience, as compared to 53% “very satisfied” with their experience on MSN. However, among their regular or primary users, Google received a 92% satisfaction rate and MSN receives an 84% satisfaction rate.

A similar effect is seen with AOL. For example, the AOL in-client search site used by AOL subscribers performed much better in terms of user satisfaction than did the public site.

Once users gain familiarity with a search site, their satisfaction and perceptions of that site tend to improve. All sites in the study saw improvements in their brand perceptions with new or infrequent users once those users had conducted several searches on their site. Ask Jeeves received the greatest jump in brand perceptions once new or infrequent users had searched on their site.

Despite the variances based on frequency of use, Google is the clear leader in Internet search and Yahoo! the clear number two search site across all types of users, and among the general Internet population.

Ask Jeeves showed improvement in the perceptions of its general search results by reducing the number of sponsored results at the top of the page. MSN’s strongest performance was in the user perception of its search results as being up to date, and the presentation of its sponsored results. In fact, MSN was the only site to show improvement in the perception of its results being up to date. AOL’s strongest performance was in the news search and product search categories, as well as in the special features category, and was driven primarily by the success of its subscriber search site.

Further detailed rankings, data and analysis are available in the full Keynote studies for the search industry, which are available for purchase.

Luxury Auto

For Keynote study of the luxury auto industry online, Keynote ranked luxury auto sites in more than a dozen categories including customer satisfaction, customer acquisition and brand affinity. Cadillac, Lexus and Saab topped the Keynote Customer Experience Rankings, an overall measure of site success across these categories and across the more than 250+ metrics measured during the study, including evaluations of the vehicle search, comparison, customization and quote/pricing functions.

Cadillac, which more online consumers perceive as “luxurious” than any other brand, was the top site based on its leadership position in the vehicle search and comparison processes, as well as the strong visual appeal of the site. The Cadillac site ranked in the top performance tier across all leading business success drivers evaluated in the study.

Lexus joins Cadillac in the upper echelon of luxury auto sites, and is the industry leader in terms of driving prospective customers from the Web site into a dealership to test-drive a vehicle, or lease or buy a vehicle. More than half (58%) of all prospective customers visiting the Lexus site said they were likely to test drive a Lexus after they visited the company Web site, an increase of [11]% as compared to buyer intentions before experiencing the site.

Virtually every luxury auto site studied saw an increase in brand perceptions and affinity once prospective buyers experienced their Web sites. Cadillac, whose brand started in the middle of the pack in terms of auto buyer perceptions, skyrocketed after users experienced its site, finishing with the industry’s highest brand perceptions. More than two-thirds (79%) of auto buyers had a positive perception of the Cadillac brand after experiencing the site.

Saab, who most auto buyers initially do not consider a strong brand to consider, had the greatest increase in brand perceptions after buyers experienced the automaker's site. The number of prospective customers who reported a positive perception of the Saab brand increased by almost a third (32%) after exposure to the site buyers described as "fun" and "friendly."

Two of the luxury auto industry's premier brands actually suffered brand damage when prospective buyers visited their sites.

One of the primary areas of frustrations for luxury auto buyers was with the vehicle views available. About one-quarter (22%) of prospective buyers complained of not seeing all the angles/views of the vehicle they wanted, and 20% were specifically frustrated with a dearth of interior photos for the vehicle they were interested in. Further, one in ten (10%) of prospective luxury car buyers expressed frustration in being unable to locate the area on a site to request a price quote.

The *Keynote Service Level Rankings for Luxury Auto Web Sites* found the Jaguar, Lexus and Saab Web sites to have the industry's best reliability, indicating those sites were highly available and experienced little or no downtime. The Lincoln, Acura and Jaguar sites were the industry's best in terms of site responsiveness, an indication of how fast the sites were in down loading pages and the array of images that are typical on luxury auto sites.

Keynote noted that the luxury auto industry has some of the most complex Web pages of any industry the company studies, with almost every site in the industry using rich media content and Flash. The homepages of the sites included in the study averaged about 700K in size, which is approximately 400% more weight than other vertical industries Keynote studies. Despite the complexity and weight of the pages, most of the luxury auto sites studied provided excellent performance for broadband users. However, the experience for a dial-up user was quite different, with those users facing homepage download times close to a minute and a half (80 seconds).

In terms of site reliability, Keynote found a large gap between the leading sites and the lower ranking sites in the study. The top ranked sites were available better than 99% of the time, while the bottom five sites averaged just 92% with several of the poorer sites registering over 50 hours of outage in a single month.

Further detailed rankings, data and analysis are available in the full Keynote studies for the luxury auto industry, which are available for purchase.

Auto – Third Party Auto

The *Keynote Customer Experience Rankings for Third Party Auto Sites* is based on an examination of 2,000 prospective car buyers as they searched and performed tasks on third party auto sales and information sites, which are operated independently of manufacturers. The Autobytel.com, Automotive.com, AutoTrader.com, Cars.com, CarsDirect.com, Edmunds.com, Kelley Blue Book, MSN Autos, Vehix.com and Yahoo! Autos Web sites were examined during the study.

Keynote ranked the auto sales sites in terms of their online customer experience based on an analysis of 250+ metrics measured during the study, including evaluation of the vehicle search process, vehicle comparison functions and the views and information available on the site.

Edmunds.com, which trails Kelley Blue Book in brand awareness, edges out the well-known auto sales and information site in terms of the online customer experience primarily because it avoids performance problems and errors with the site, which can frustrate prospective customers. Some of the company's primary competitors experience performance problems, such as long page load times or errors, which cause their standing with customers to dip.

The top three auto sites are relatively competitive with each other in terms of the online customer experience and customer conversion. However, Edmunds.com edges out its leading competitors based on strong user perceptions of its site

performance. Service levels always play a role in customer perceptions, but we see a particularly heavy influence in the auto sales and information industry.”

As auto sites increasingly rely on video and Flash, and provide content-heavy and rich internet applications to attract customers, site performance will increasingly need to be monitored to ensure an error free experience for the customer.

Edmunds.com also performed strongly in the vehicle comparison function and in the vehicle views and information categories. Kelley Blue Book performed relatively well across all categories measured in the study, but particularly well in the overall design and organization of its site, as well as on vehicle availability, views and information. Cars.com bested its competitors in the vehicle search function and in the vehicle advertising process.

Vehix.com was notable in its strong overall improvement since the last wave of the Keynote study conducted just under a year ago. The site, which redesigned its home page in the past year, saw a significant jump in the home page appeal category, and in the overall design and organization of its site.

The leading independently branded auto sales sites—Edmunds.com, Kelley Blue Book and Cars.com—all outperformed the auto sites of the leading search engine brands. However, Yahoo! Autos had a relatively strong showing, receiving a strong overall customer satisfaction ranking.

The leading independently branded auto sales and information sites also had stronger positive brand perceptions than those sites operated by the search engine companies. Overall brand awareness in the third party auto industry is very low, with only Kelley Blue Book starting out with strong brand perceptions. Approximately 70% of the prospective car buyers in the study had a positive brand perception of that company prior to testing the site, a likely result of Kelley Blue Books well-known off-line publication.

Once prospective customers test-drive the leading sites, their brand perceptions skyrocket, with Yahoo! Autos jumping 57%; MSN Autos jumping 54% and Cars.com jumping 52% in positive brand perception once prospects test-drove their sites.

In the race to attract new customers, Edmunds leads with 70% of prospective customers seeing it as the site that “has tools that make vehicle research easier.” Kelley Blue Book is the second best site at converting browsers into sales leads, and out paces its competitors as the site consumers trust and see as having a good reputation; 55% of study participants say they trust Kelley Blue Book, a figure nearly twice the industry average. Cars.com ranks third in the customer conversion category, and 60% of customers feel its pricing information is detailed and up to date, a figure significantly above the 47% industry average. More than two-thirds (71%) of Yahoo! Autos users say that site is easy to use, propelling that site to the fourth position in prospective customer conversion.

Further detailed rankings, data and analysis are available in the full Keynote studies for the third-party auto industry, which are available for purchase.