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WHITE PAPER

How Travel Sites Can Give Mobile Users Fast and Visually Engaging Web Experiences

Visually Engaging Travel and Hospitality Sites Are the New Normal. How Can Site Publishers Extend These Experiences to Tablet and Smartphone Users?

TABLE OF CONTENTS

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Immersive, Emotionally Compelling Travel and Hospitality Sites Are the New Normal. How Can Site Publishers Extend These Rich Digital Experiences to Tablet and Smartphone Users and Make Them Fast at the Same Time?

Travel and hospitality sites are in the midst of a virtual mobile Gold Rush. Bookings from mobile devices – phablets, smartphones, and tablets – are increasing far more rapidly than bookings from laptops or desktop computers. These classes of devices also dominate growth in site visits. Travel m-commerce sales in the U.S. are forecast to reach $59.5 billion in 2017, up from $16 billion in 2013. 49 percent of travelers now actually purchase flight tickets from a mobile device.[13] That jumps to 60 percent for travelers aged 25 to 34.[14]

At the same time, mobile users have come tzo expect immersive, rich experiences with large, sharp images, personalized recommendations, and social graph integration – with zero wait time. To keep these customers happy and continue booking growth, travel and hospitality site publishers need to deliver these richer experiences over unreliable and often clogged cellular data and WiFi networks.

The rapid adoption of Retina-class displays further accentuates user expectations of high-resolution images and visually impressive web experiences. Additionally, next-gen travel and hospitality sites incorporate personal recommendations and other highly dynamic types of content that are not easy to cache and must be updated frequently and customized for individuals. Pushing large images and dynamic content over wireless connections often results in slower website load times and a poor user experience. Annoyed users view fewer pages, conclude fewer transactions, or completely abandon sites.

Poor website experiences result in negative word-of-mouth transmissions both online and offline, impacting customer loyalty and damaging brands.

The Perfect Storm of hard-to-optimize dynamic personalization and hard-to-deliver larger images has been too much for legacy web performance tools, which cannot provide the speed that next-generation travel and hospitality sites need. As a result, website publishers face an urgent need to find new solutions to improve site performance in order to attract, retain and do business with mobile travelers.

This white paper explores how travel and hospitality site publishers must adapt their technology to successfully deliver immersive websites anywhere regardless of connection or device type. Further, the paper discusses the imperative to provide high-resolution, high-quality site experiences and improved website performance at the same time, without sacrificing one or the other. Lastly, the paper describes a new web performance, mobile-centric technology for efficiently delivering immersive digital web experiences without making users.

Introduction:
The Great Mobile Travel Disruption

In the last three years, mobile has supplanted desktops and laptops as the online engine of growth for mobile devices would reach $25.8 billions in 2015, triple the total in 2012.

Smartphone purchases of travel are on the rise; nearly 26 million US consumers booked travel via smartphone during 2014. [15]

Mobile bookings grew at 20 percent in the first half of 2014, while travel bookings from desktops grew just two percent. [16]

Mobile devices are becoming the travel research tool of choice. Sixty-seven percent of travelers research flights, and 83% research hotels from their mobile device before or during their trip. [17]

In the US, mobile bookings as a percentage of online travel bookings will nearly triple, from 10% in 2013 to 27% in 2015. [18]

Not surprisingly, these highly connected travelers also rely on social media and personal recommendations when booking travel online. More than 50% of travelers post updates and comments to social media during their trips 3. These travelers not only research and book travel on mobile devices but continue to use mobile devices at their destination to research and purchase other activities. They put a premium on incorporating personally relevant information.

Increasing numbers of travelers book their hotel stays while in transit or on the day of arrival. This is often performed on a smartphone or a tablet after arriving at the destination. PhoCusWright found that 20% of automotive road trippers spontaneously book hotels via mobile devices while on the road4 and 21% of last minute hotel bookers did so from smartphones, while 13% did so from tablets. [5]

All these numbers mean that travel sites must deliver dynamically updated and personalized content at high speed to the full range of mobile devices, to capture the traveler in the mobile moment of need. Travel and hospitality brands that do not upgrade their web performance technology and adapt to the varied types of mobile devices risk losing favor with their fastest-growing, most lucrative customer segment.

Building Personalized Emotional Experiences

As travel sites see more of their visitors come from mobile devices, they have had to rethink the old browse-and-book paradigm. They are turning to a more immersive online travel research and booking experience, which provides useful tools and recommendations to travelers, not only before they leave but also while they are in transit or at their destination.

Imagery has long been important in travel,even for business travel. "Travel is uniquely suited to visual media, and the industry has extensive experience in its production," according to "Visuals Are the New Language of Content Marketing in Travel. [19]

These trends – mobile consumers, richer imagery, personalized and dynamiccontent – mirror trends on the greater Internet. Gogobot, Airbnb, Viator, Jetsetter, Wanderfly and a host of newtravel sites emerged in the past decade to deliver a differentiated, personalized and engaging online experience to travelers. These experiences were designed to arouse emotions in visitors with larger and higher quality images, social connections, and more relevant information as a means of standing out in the crowded online travel marketplace. These sites pioneered the use of higher-resolution images that are several times larger than the historical standard.

Impact of the Retina Display: Mobile Travel Sites Need Bigger, Better Images plus More Bandwidth

The introduction of Retina displays has had a significant impact on travel and hospitality site publishers. The higher pixel density means that thumbnail images and lower-resolution photos that were passable on smaller smartphone displays are now typically perceived as grainy, smudgy, or low quality.

Rolling out much larger images has several consequences on mobile devices. They require more bandwidth to push to end-users. The images might require more device memory and better caching and storage structures as well as changes to JavaScript usage and page layouts in order to maintain high-quality customer experiences.

KAYAK, one of the leading online travel sites, asked its suppliers to provide it with higher resolution images. Billy O'Donnell, the Chief Architect of KAYAK Mobile, speculated that in the next few months "...users may consider it 'gross' when they view low-res images in iPad apps or when browsing mobile websites from their iPads," in an article reported by Tnooz. Like KAYAK, popular last-minute hotel booking site Hotel Tonight optimized their mobile application to take advantage of Retina displays with higher-resolution imagery and a richer, more detailed and dynamic collage UI than it had offered on its initial smartphone-based product

The sites also publish frequently updated, high-quality editorial content syndicated from multiple review sites and from prominent travel publications as well as from the social graph. Increasingly, travel sites seek to personalize content either by displaying information that caters to past browsing behavior and recorded tastes, or by curating information from relevant sources

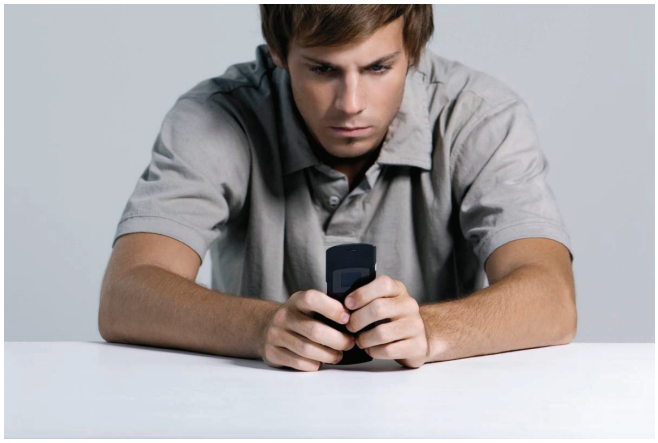
Impact of the Retina Display: Mobile Travel Sites Need Bigger, Better Images plus More Bandwidth (cont.)

within the user's social graph, including likes, reviews and user-generated photos. Forward-thinking travel and hospitality publishers deliver cutting-edge visualization tools such as full 360-degree panoramic views of rooms and common areas and 3D maps of properties and destinations. This new level of immersion and "being there" experience allow users to emotionally perceive and judge their destinations with specificity not previously possible.

The rationale behind immersive sites is well established and well proven. Larger, higher-quality images draw higher click-through rates (CTRs), improve website "stickiness," and boost conversions to purchases. A study by a research team at eBay Labs found that listings on the online auction and shopping site which adhered to basic guidelines for image quality (display of image against a white background, and use of higher-resolution images) enjoyed higher CTRs.

In general, too, personal and unique photos drive engagement. After British Airways redesigned its online magazine to deliver a higher-fidelity experience, including user photo contests, that section of the site quickly became the most popular; with visitors to that section averaged 10.5 page views and 9 minutes spent. The two fastest-growing travel sites in recent years elected to use very large and high-resolution images (in excess of 500 kilobytes), further validating the value of large images to drive revenue. Personalization and social media integration are also well documented to drive engagement. As cited above, PhoCusWright found that over half of travelers engage social media while traveling by posting about their trip.

Travel Sites Still Too Slow, Impeding Engagement

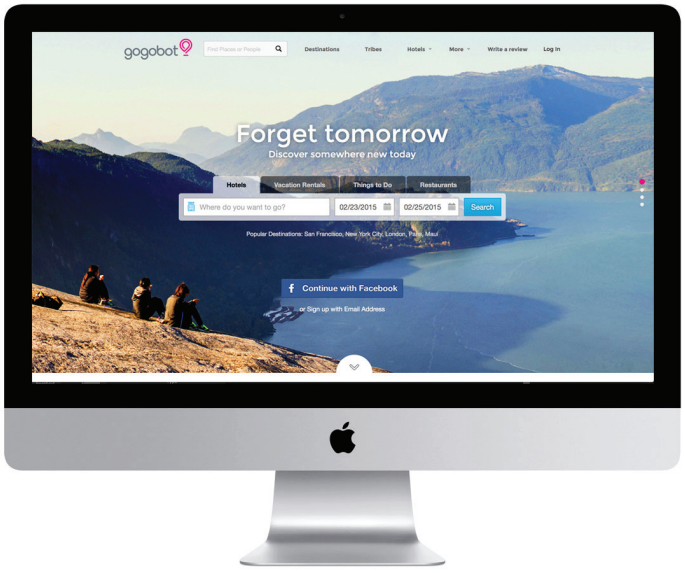


Travel and hospitality site publishers face a major challenge in delivering the same high-quality experience with large images and deep dynamic personalization to the fast-growing mobile user base. To date, too, there remains a wide variability in web performance in this sector. For example, Keynote Systems measured a difference of a full 16-second differential between the fastest and slowest loading mobile sites among 30 top hospitality and travel publishers, according to its Mobile Travel & Hospitality survey.[8] Slow load times remain a leading complaint in numerous surveys of travel and hospitality site users. The trends towards big images and personalized, dynamically updated content (which cannot be cached) make it significantly tougher for publishers to provide web experiences that are responsive enough to meet user expectations. As cited above, PhoCusWright found that over half of travelers engage social media while traveling by posting about their trip.

Travelers need fast response because they cover a lot of ground each time they buy online. "Google cited that travelers spend an average 55 minutes to book a hotel and flight, visit 17 websites, and click four different search ads per travel search, with 90% of those travelers conducting the booking process over multiple screens.[1]"

Example: How Gogobot Delivers a Visually Engaging and Fast Travel Research Experience (cont.)

"To deliver to mobile users in a timely fashion a completely dynamic, personalized travel guide that gives every user a fully personalized, dynamically-built page and uses images much larger than the standard size, you need an entirely new kind of web performance technology that goes beyond CDNs," explains Ori Zaltzman, CTO of Gogobot. "By streaming web applications instead of relying primarily on caching and other dated technologies, Instant Logic slashed our page load times by 1.5 to 2 seconds – a 45% improvement – without requiring any changes to our code or user behavior. This not only saved us engineering time but it gave us performance superior to any CDN we used before, while boosting conversions and revenue."



Fast Mobile Travel Site Performance is Critical to Conversions But Has Consequences

Publishing gorgeous immersive images of travel destinations does entail tradeoffs. While immersive site improvements drive usage, stickiness and purchases, these enhancements also "super-size" websites and web applications. Larger images, 360° viewing, personalization features and dynamic construction of web sites targeted to individual users can boost the required data for a page by 50% or more. In fact, the average web page now contains nearly 1.9 megabytes of data including images, HTML, JavaScript and other components. The average web page size doubled over the past three years according to the HTTP Archive and a whopping 62 percent of the page load is images. Larger payload increases the time a user waits to access the website, to see the improved images and functionality load on a page, and to begin interacting with the site. This difficulty is particularly acute for mobile users, who not only are more likely to face wait times due to clogged mobile network conditions, but also more loathe to waste precious moments while traveling waiting for a page to load.

How to Lose Your Visitors in Just Three Seconds

According to web performance measurement company Compuware, every one-second delay in page load time results in 11% fewer page views as well as a 7% decline in conversions. After an unsatisfactory web experience, Compuware found, 88% of people are less likely to return to a website, 78% went instead to a competitor's site, and 42% discussed their bad experience with friends or in forums online. Aside from reducing user engagement and conversions, slow sites suffered after Google began to include page load times in its ranking criteria. In the travel sector, in particular, PhoCusWright found that 43% of online travel and lodging shoppers will abandon a site after 3 seconds of waiting, whiled 20% will open a competing travel site in another window. Roughly one-third of visitors will not return to a site if it has technical glitches or errors.

Web Page Loading Time

Questions:

A) What are your expectations for how quickly a Web Site should load when you are browsing or searching for travel products? Select one.

B) When planning travel, how long are you typically willing to wait for a single Web Page to load before leaving the Web Site? Select one.

	Wait	Leave
0-1 Sec	5%	2%
1 Sec	15%	8%
2 Sec	30%	16%
0-3 Sec	57%	-
3 Sec	33%	31%
+4 Sec	16%	43%

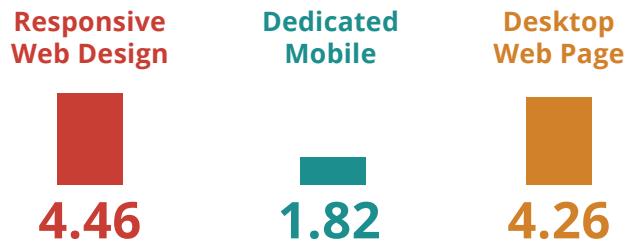
Base: Online Bookers (2,441 users)
Source: PhoCusWright's Consumer Travel Reporst Second Edition

On Diverse Mobile Devices, Big Images Are Even More Problematic

In fact, the performance of immersive sites on the expanding universe of wireless devices – the fastest-growing segment of the online travel marketplace – remains woefully subpar. Download speeds over wireless and mobile networks remain far less predictable than over wired networks. All types of mobile networks, when accessed from public domains, regularly clog. Think of access from the WiFi network at a downtown coffee shop during morning rush hour, or a 4G network in a crowded city street. Download wait times are likely to be high, and this creates a challenge for web performance engineers, who must optimize a high-quality site for the full range of potential network conditions.

User expectations for fast site loads on mobile devices are becoming more exacting. A study by Equation Research[11] found that over 70% of all mobile users expect sites to load quickly, up from 58% two years earlier. The study found that nearly half of all mobile users are unlikely to return to a website that was difficult to access from their phone and 57% are not likely to recommend the site to a friend. Google now factors mobile website response times into search rankings. Travel sites that fail to deliver fast response times to mobile users risk getting buried in the search results, even though they have done everything else necessary to earn high organic rankings.

Average Page Loading Time by format (in sec)



Speed or Quality: A Devil's Bargain for Travel and Hospitality Publishers

To date, travel and hospitality site publishers have relied on legacy technologies such as content delivery networks (CDNs) to improve page load times. The fundamental acceleration technique with CDNs is to cache frequently used components, such as images, and store them close to the user. However, these technologies were designed to solve 15-year-old problems of latency when the core of the Internet was slower and less reliable. Today, the core is far faster and more robust.

What CDNs cannot address well is delivering large cached images over variable speed (and often slow) Last-Mile wireless connections – from the tower or the WiFi router to the device. Similarly, CDNs were not originally designed for the social web environment of micro-personalization and completely dynamic websites. As a result, publishers find that a growing numbers of travel and hospitality site users coming over these connections still experience unacceptably long wait times to load web applications.

Neither Visual Downgrades nor Slow Immersive Experiences Will Succeed

To minimize the time a user waits until being able to interact with a travel site, many brands have resigned themselves to a "visual downgrade" of their mobile or tablet sites by using lower-quality images, removing rich graphics and slimming down engagement techniques. To avoid this fate, some travel and hospitality publishers have resorted to using adaptive image compression. This technology allows publishers to reduce image quality for users depending on network conditions and send mobile device owners lower quality images when their network connections are slow. Unfortunately, lower quality images result in diminished user experiences, lower clicks, reduced time on site, and lower conversion rates. The negative impression caused by poor-quality images is magnified on devices with Retina-class displays

For Fast, Visually Engaging Travel Experiences: Software Defined Application Delivery

A new technology invented by Instart Logic, Software-Defined Application Delivery (SDAD), allows travel and hospitality sites to avoid a forced choice between fast load times and visually engaging web experiences.

Software-Defined Application Delivery (SDAD) is a new architectural approach that decouples the hardware and network from the software used to deliver web applications. The controller software that enables a software-defined application delivery system provides policy management and orchestration of feature options like image streaming, image transcoding, image re-sizing and more.These complementary features were developed at Instart Logic, and are enabled by a unique cloud-client architecture which uses information from the browser to package and deliver web pages and applications for faster and richer user experiences.

Image Streaming
By painting the optimal number of pixels to secure a strong first look and then painting the rest of the picture in the background after other key processes load, Instart Logic saves valuable time on two fronts. It loads fewer pixels and avoids the two-stage process employed by other CDNs that claim adaptive image delivery.

SmartVision for Image Streaming
This novel technology works alongside ImageStreaming. Instart Logic's scientists developed algorithms to analyze the content of pictures to determine how much of the image must be initially streamed for a user to paint the image on their device without noticing reduced image quality. For example, a picture of a beach and sky requires low initial pixel density while a picture of a human face requires higher pixel density to achieve the same perceived image quality.

SmartVision for Image Transcoding
This is the latest technology released by Instart Logic and it determines for each individual image the optimal level of compression that can be applied without compromising image quality. Like Image Streaming, this technology can reduce the size of images on a page by as much as 70% on the first paint of the page to allow readers to see the images and interact with them quickly.

Image Resizing
In the past, being able to deliver the right image to a wide variety of screen sizes and resolution has required massive customized backend resizing systems with large storage requirements. On-Demand Image Resizing is an innovation from Instart Logic which generates just the right image size on demand for any device, scaling automatically to each smartphone and tablet, cutting wait times significantly

For Fast, Visually Engaging Travel Experiences: Software Defined Application Delivery (cont.)

Dynamic HTML Streaming
Instart Logic saves crucial time by streaming the non-unique dynamic HTML to the browser even as the web server is generating the unique dynamic HTML. This allows the browser to make use of previously wasted time and render other page elements faster. HTML streaming provides a dramatic decrease in load times and faster end user experience.

InstantLoad
Today's browsers have multiple cache (or memory) layers. Each cache has a different performance level. InstantLoad automatically manages these device caches and places the most important components of a web site in the faster caches. That means things like logos, background images, and other information which appears on every page will quickly appear when the user loads another page, allowing the browser to more quickly start downloading other pieces of the site which cannot be cached and must be streamed in. InstantLoad can cut response times by 30%.

Cutting-edge travel and hospitality publishers have deployed Instart Logic's SDAD platform and seen dramatic improvement in page load times and customer engagement. The combination of SDAD-based technologies that Instart Logic has developed improves web and mobile performance for hospitality and travel sites by typically 30-70% upon switching from a content delivery network (CDN).

A Better Network

While Instart Logic's technology provides unique capabilities for the Last Mile
delivery to the browser of the user, the company also has unique technologies to provide the fastest possible network connectivity deeper in the Internet and at the layer of the actual protocols dictating how pieces of data are delivered across the web from the origin server to the end user's device.
Instart Logic also provides security services that are essential for travel sites and other ecommerce sites. These include:

Global Network Accelerator
Instart Logic developed this technology to leverage its globally-distributed service and its new IPTP protocol to erase the network bottlenecks caused by distance and congestion which occur with older protocols like HTTP, HTTPS, and even TCP. It provides acceleration from the backend web server all the way to the users' devices.

Secure ProxyWall
Combines web application firewall capabilities with origin protection. The ProxyWall inspects plaintext and SSL traffic; alerts, rate-limits or blocks malicious traffic.

PCI Compliance
The Instart Logic service secures and accelerates sensitive credit card transactions, enabling faster performance from initial product views to final checkout with a dedicated, isolated PCI Level 1 certified service built and run for travel & hospitality, e-commerce, enterprise, and financial customers.

DDoS protection
This service provides a shield in front of backend infrastructure. Instart Logic's globally distributed network, with its massive connectivity leveraging next-generation anycast networking, ensures that a site stays up and running to service legitimate users during an attack.

Requirements and Network Reliability

Instart Logic's software defined application delivery platform does not require website publishers to modify any code, nor are end users required to download any plug-ins or extra software.
Site publishers can deploy with a simple change of DNS settings to redirect traffic through the Instart Logic cloud service. It works across all standard browsers.

Instart Logic's SDAD network is deployed globally across more than 30 locations covering all the major Internet peering points. The network is built with no single points of failure and multiple levels of redundancy at every layer, from racks to cabinets to redundant load balancers to power supplies to ISP connectivity. To date, Instart Logic has delivered uptime of 99.999% and has not experienced a single significant outage. Instart Logic is designed as a drop-in replacement for, and significant improvement over CDNs.

Instart Logic and its Breakthrough Technology

Instart Logic was created with a single mission: to bring an intelligent, fast and scalable solution to the challenges of web application delivery to companies whose business depends on performance.

Some of the most technically advanced travel and hospitality website publishers have replaced their traditional CDNs with Instart Logic's Software-Defined Application Delivery (SDAD). They find this to be the easiest, most economical, and most rapidly implemented solution for super-charging immersive website performance. Instart Logic's SDAD service gives travel and hospitality sites a practical, immediate and fast way to advance in the war to attract more business from mobile device owners and boost their own bottom lines through increased bookings.

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