Travel technology in the era of Web 2.0

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Abstract

This article is a compilation of analyses, publications, presentations and panel discussions on current trends in travel technology. The text is largely based on the convention documentation from the TRAVDEX@ITB congress, held on 9–10 March 2006 in conjunction with the leading international consulting firm for travel technology, PhoCusWright Inc., during the International Tourism Exchang ITB Berlin[1]. In addition, studies and publications from PhoCusWright Inc. have been integrated[2].

1 Introduction

In Travel 2.0 – the industry's collective application of Web 2.0 as defined by PhoCusWright, Inc. – the consumers blog, tag, text messages, map and mash in real time[3]. Many people claim that the Internet hype is wearing off. However, this is not the case. For the online applications, a new wave of enthusiasts is taking up the reigns, giving signs that continued development is inevitable.

Looking back on the early days of Travel 1.0: At this point, booking basics moved online, enhancing the online travel experience. Soon, travelers began focusing on price. Many people then began to see travel as just another commodity. Searches reigned supreme and consumers began to view price as the paramount criteria for purchasing.

Soon after, the birth of Travel 2.0[4] made technology for travel distribution faster and cheaper. The digital age and travel buying experience entered the scene.

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1 See www.itb-convention.com.

2 See references.

3 See Alby (2007) for an introduction to Web 2.0.

4 According to PhoCusWright, Inc., Travel 2.0 is defined by (1) transparency, (2) collaboration, (3) better basics, (4) speed and (5) predictability (Wolf 2006, Bray 2006a).

Digital music took off fast. Consumers began downloading individual music songs and missing out on the unique compilation of music and continuity designed by record companies and artists. Soon Nikon is going to stop producing film photo cameras. This is mirrored by the increased popularity of photo sharing on or through the Internet. And now, with the emergence of digital mapping, our children will no longer experience what it means to be lost.

Online is still growing, however this growth is slowing down. Currently the European online leisure/unmanaged business travel is estimated at € 41.6 billion and is expected to grow into a € 57.2 billion branch by 2007. In addition, the European travel market is following in the footsteps of the USA in regard to the online penetration in the travel market. In 2007, the penetration of online leisure and unmanaged business travel in the total travel market is projected at 27 % in the European market (Table 1). Currently, 61 % of travelers consult online search engines before booking their trips, be it online or offline. Thus, the power is transferring into the hands of the buyers. With search engines, consumers can compare options for their trips and gain a general overview of the offers. In fact, the ability to compare destinations, hotels, locations and such is becoming even more important than the price of the trip itself.

Table 1. Market share of online travel in the U.S. and in Europe

Leisure/unmanaged business online travel as a percentage of the total U.S. travel market								
1999	2000	2001	2002	2003	2004	2005	2006	2007
4 %	7 %	7 %	14 %	21 %	25 %	29 %	34 %	38 %
Leisure/unmanaged business online travel as a percentage of the total European travel Market								
1999	2000	2001	2002	2003	2004	2005	2006	2007
NA	NA	NA	4 %	6 %	9 %	14 %	20 %	27 %

Source: PhoCusWright (2006a).

The social relevance of these technologies becomes apparent in the emergence of price transparency. More power is flowing into the hands of the users with the emergence of new search technologies; and, it is not the lowest price that wins at the end of the day. First of all, some people believe that metasearch can be harmful to both the industry and the consumers. In the USA, 87 % of search and metasearch users are positively influenced in their travel choice. Three out of ten use metasearch for travel research. Furthermore, many American companies provide portals for interested parties. Google actually provides user interfaces. A second point is the social networks that provide personal search results and help travelers narrow down their searches. These networks act like a travel agent and are not just hype. They even enable users to broaden their network to online and offline contacts. Such an example is meetup.com – a meeting and events organizer. Or site59.com – at this Web site, people living in or flying from different cities can plan trips for meetings, weekend getaways and vacations. The site looks for

flights that maximize the time together. And, travel posts gather user reviews and user-generated information. Certain companies do of course try to fabricate customer reviews; however, this is counterproductive for the industry as a whole. Simply put, users need to communicate candidly and if companies do not provide suitable and reliable methods, users will create their own.

Another important technology is mapping. Maps can be created online to visualize the location of hotels, airports, attractions, hotspots etc. Google, msn as well as many other companies are forging their way into this attractive new sector. With mashups, users can create unique maps with tagged image overlay. Users can locate parking lots, restaurants, walking tours etc. from the comfort of their home before arriving at their destination. Users can map out the route from the airport to the travel destination, view available hotels, catch a bird's eye view of the city and even locate and book a room. Blogs are hacker mashups – a trend that has 3 new blogs popping up every day. Even in wireless technology there are innovative ideas for the travel industry. And rich media seems to offer limitless possibilities for improving the user experience.

As such, travelers view travel planning as an experience in itself. Customers want to have power in their own hands and companies are jumping at the chance to provide this information. The Internet holds the secrets to the opportunities of a lifetime: Users can learn, explore, connect etc.

2 Search and metasearch

Price comparison (metasearch) is one of the most discussed topics in the online travel landscape. Consumers can compare prices from different Web sites themselves, use online agencies or even rely on metasearch. Technology is affording more choices for consumers and more directions for the industry. But, how will technology determine the winners and losers?

In a panel discussion with Jean-Marc Darrigol, Director of Engineering, Yahoo! Europe, Wayne Muesse, Vice President, Engineering and Operations, SideStep Inc., Patrick Urso, Managing Director and Chief Product Officer, Tazzoo.com, Ross Veitch, Chief Product Officer, Bezurk Pte Ltd. and Paul English, Co-Founder and CTO, Kayak.com[5], John Bray, Convention Chair and Vice President Advisory Services at PhoCusWright Inc. analysed the most important developments in search and metasearch.

To begin with, the difference between "search" and "metasearch" must be defined. The panel guests stress that metasearch is characterized by value added content and information availability in real time. From the perspective of metasearch providers, users need clarity and real-time information about destinations, hotels,

[5] More information is available at the individual websites: travel.yahoo.com, www.sidestem.com, www.tazzoo.com, www.bezurk.com, www.kayak.com and www.phocuswright.com.

flights, tickets etc. around the clock. Metasearch sites fulfill this niche and deliver the needed information.

One of the travel technology myths has metasearch sites defining the path to commoditization of travel distribution. Users are unjustly accused of simply looking for the cheapest prices and are informed that metasearch sites best fulfill such needs. Panel guests adamantly deny that users only worry about the price.

SideStep perceives metasearch as an instrument that lets suppliers tell the story by providing rich information. Effectively, companies are just looking for a way to best represent themselves. And, users provide valuable input for metasearch companies. Often the same hotel is posted on different channels. Users usually choose the channel providing the most information. SideStep helps hotels market their product and tries to steer the user to the where he can find relevant information. Users merely have to filter through the options. SideStep also provides high fidelity and currently has 600 hotels in Paris. In addition, SideStep has designed a rich interface based on AJAX, which does not impose search burdens on the users. More pictures, more information and content technologies are uploaded and high content is provided.

Tazzoo.com also emphasizes content not prices. This company focuses on added value content and provides users with what they want; the main issue is to build content. Tazzoo.com also tries to merge different blogs and provides professional information. It needs to bring the user to the Website. All products have to be classified and flagged. Synonymy is definitely a must for all sites dependant on metasearch. Tazzoo.com can also create dynamic packaging based on user-generated information. The user is pushed to make a decision on the Website and then go to the supplier.

Bezurk stresses that using metasearch to commoditize travel distribution is just a red herring; metasearch actually strives for the opposite. People do more than just look at prices; they are also interested in where the hotel is, what amenities are provided, what the property and rooms look like and whether it is a reputable establishment. As for airlines, users like to see the seating configuration of the various airplanes, compare prices and aggregate information from the suppliers. Bezurk provides consumers with the information they require or desire. By putting more information and content on the site, consumers have more information to make an active decision concerning bookings. Information does no only come from Bezurk. User-generated sources such as blogs are also used. Bezurk believes that content differentiates more than price, which can actually increase the booking rate with correct application.

Kayak allows users to create lists or themes, which appear online. The community then votes on the best lists/themes looking for the best deal anyone has ever found from A to B. When an agency is unable to answer a customer's question, Kayak can! Kayak is incredibly user focused. Users can communicate with each other using this Web service, check and see where friends and neighbors are flying and even create a track list of whatever themes they want (i.e. shipwreck diving destinations). Trips appear on Kayak.com. Users can then look for the best deal.

This is a very different service than what regular travel Web sites offer: it is activity specific. Kayak has a lot of user-generated services and collects a lot of content, which nonetheless could be better managed. Communities are high on the scale for many companies.

To achieve these aspirations, companies need to spend time developing their systems and technologies. John Bray asked the panel guests to discuss whether their company placed more emphasis on the front-end or back-end.

Yahoo! Europe focuses on front-end. They are trying to include and order as much content and information from as many suppliers as they can. Yahoo! wants customers to be able to navigate easily through the information; new ways for providing better service are being developed. Yahoo! is also currently categorizing in order to aggregate content. In the back-end, Yahoo! concentrates on partnerships.

SideStep is concentrating on both aspects. In the back-end, they want to let the suppliers tell their story. The suppliers give the content to Sidestep and it is uploaded for virtual tours. For hotels, additional content is required. At the front-end, SideStep concentrates on user interaction and provides an area for user reviews.

Last year Tazzoo.com focused on the back-end. They built up a wanadoo frame and laid emphasis on the technology required to provide the service. Tazzoo.com is now concentrating on both the front-end and back-end. In the back-end, Tazzoo.com wants to increase performance, increase the number of Web sites and maintain the Web sites. In contrast, Tazzoo.com is working on loyalty programs and mapping content in the front-end. The interface is very important to gaining and retaining users.

Bezurk states a 60/40 ratio for back-end and front-end activities. In the back-end, Bezurk focuses on integrating partners and interfacing companies, owing to the fact that partners also use the Bezurk interface. In the front-end, Bezurk concentrates on altering price lists, integrating tools necessary for the user. If users find navigating difficult, Bezurk inserts new technologies and applications. Obviously, usability is a technical component.

Another issue deals with revenue models. Revenues are generally generated through the pay per click compensation method. But, what happens if the partner refuses to pay?

Bezurk has many pay per click revenue contracts, meaning that Bezurk receives a minimal fee from its partners for every time someone clicks on their company's information. And, three sponsored searches are located at the top of the Website.

SideStep supports whichever method the suppliers want, be it pay per click or cost per acquisition and has never been in a situation in which suppliers have not paid. SideStep simply takes on a advertising function for its partners. Admittedly though, some portals are getting abused.

Yahoo! receives revenue from pay per click contracts. Yahoo! pushes travel destination with all possible marketing tools and events. Of course, click abuse exists. However, Yahoo! tries to filter abuse when it is detected. It is a large issue that Yahoo! is working to prevent and solve.

A critical question arises as to whether metasearch companies are able to track consumers who make decisions on their sites, but might later decide to purchase directly. Yahoo! cannot track this information. SideStep uses a different technology for each supplier to track consumer behavior. Tazzoo.com and Bezurk also use tracking technology. In fact, Bezurk can track every person with online or offline bookings that correspond one to one with the information from the site, the so-called bridging technology.

3 User-generated content

User-generated content: Everybody's doing it ... but who's sorting it? The meteoric rise of social networks and user-generated content has certainly caught the attention of the travel industry's technorati, and online travel agencies, suppliers, portals and metasearch companies alike reported that they have already started incorporating user-generated content into their Web sites or they plan to. With this new flood of content, though, travel companies will need to have a strategy for helping users identify the information that will be most useful to them. When asked how they intend to sort and rank user-generated content, several speakers indicated their strategies are still under development.

Initially, travel providers summarily dismissed user-generated content, seemingly more worried about the occasional 'bad review' than any potential upside.

Perhaps sensing that finger-in-the-dike approaches are no longer satisfactory, savvy marketers, thus several providers are beginning to leverage user-generated content to actually stimulate travel demand, as well as to tear down their "walled gardens" in order to simplify the laborious, painstaking task of content management.

User-generated content and community are certainly hot topics and cornerstones of Travel 2.0. So popular in fact, that Yahoo! Trip Planner is overhauling the search engine concept by asking users to answer each other's travel questions in addition to looking for answers online. TripAdvisor, the patriarch of the user-generated content movement, the second-most visited Web domain in the travel category and member of the Expedia family, boasts 23,000 featured destinations (each with several thousand reviews).

At the same time, with property descriptions such as "Recently renovated," "At the beach," "With its innovative enhancements and stylish new décor," "Minutes away from all of the city's major attractions," and "Located in the heart of the city," and picturesque thumbnail images of bed linens, jubilant lobby floral arrangements and glass-shiny pools, it's clear something is missing. Let's face it, hotel marketers have struggled to merchandise their products in order to escape commoditization and expand beyond the room.

On the heels of a major re-branding campaign that has also resulted in the search-engine inspired home page for FourPoints.com, and expert travel "blogger" site TheLobby.com (www.thelobby.com); with the moniker of "Belong," the recently

redesigned Sheraton.com (www.sheraton.com) breaks from the traditional mega-chain ranks by putting user travel stories, not tucked away, but at the center of the home page. And so far posted reviews seem biased to those that go way beyond just the room. For instance, one guest story, for a property well to the east of Chicago, tells of a nearly missed dinner cruise. By allowing guests to post their own travel stories, instead of merely reviews, Sheraton has truly embraced oft-ignored facets of the "Content is King" moniker to cover the complete travel experience within the context of a guest's desire (whether to achieve their mission or escape the ordinary).

The Swiss premium hotel chain, Mövenpick Hotels & Resorts (www.movenpick-hotels.com), undaunted by potential negative feedback, has included a link to TripAdvisor for reviews about their property. A query to their Central Park Roma location yielded 16 English reviews, not all of them were positive, and a popularity index of 210 out of 988 hotels in Rome. Intercontinental hotels is also considering adding its own peer review section to the IHG Web site.

It's not only suppliers that are getting in on the act. Expedia (www.expedia.com) asks customers to rate their purchased rooms in four categories including service, condition, cleanliness and comfort, along with their reviews. Perhaps the infamous black-clad review guys of sister company Hotels.com can finally get new jobs. We just wonder why Expedia chose their own review site, with TripAdvisor in the fold?

In the initial race to grow online travel distribution, most Web sites were looking to become self-contained publishers and providers. Unfortunately, for too many in the travel industry, maintaining this walled garden has turned into a never-ending task (perhaps that's why the Travelocity Gnome crashes into stadium lights in the TV ad). Though it lacks a precise definition, Travel 2.0 generally refers to Web services that let people collaborate and share information online. A wave of dynamic travel sites have emerged that take full advantage of new models of collaboration for trip planning. Undaunted by the startups, these providers have embraced, without wielding control over user-generated content, a sense of belonging at the same time they attempt to diminish their own content-management challenge.

With 100 million downloads a day on YouTube.com (www.youtube.com) demonstrating the popularity of rich media, look for these sites to move beyond pictures and reviews to the user-generated video shortly.[6]

4 Social networks and tagging

The potential of leveraging the power of group forming networks in a business context is substantial. To do this, established travel companies may need to rethink current business models and practices.

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[6] Taken from Bray (2006b).

This area has inspired a huge number of travel startups focused specifically on building community and enabling group travel. TripAdvisor was among the first to capitalize on this opportunity, and a range of general and niche social-based startups have followed suit. Some are designed to help travelers benefit from the experience of others, while companies like Groople and TripHub are enabling groups of travelers to actually plan and/or book their trips.

Social networks empower travelers and, in one respect, enable them to operate outside the establishment, sharing information and ideas that are unfiltered and (hopefully) free of marketing bias. This might appear to favor newcomers, but online travel agencies and portals have the benefit of a high volume of site visitors and a large customer base and should be looking for ways to exploit these assets. Yahoo! in particular has been busy integrating a range of Web 2.0 tools with its new Trip Planner tool, which enables travelers to view and rank trip plans produced by its large customer base.

Transparency, community, personalization, experience: the buzzwords associated with Travel 2.0 have been thrown around at industry events and have clearly already created a buzz at some travel companies. Others appear to be lagging behind. While the various Travel 2.0 technologies and trends stand to benefit startups and established travel players to varying degrees, the winners in both categories will be those nimble enough to adapt their business plans to the new dynamics of the online marketplace.

Social networking and consumer-generated content are cornerstones of Travel 2.0. Whether for purely time-starved, or simply voyeuristic reasons, consumers are increasingly turning to tagging, a mashup of both social networking and consumer-generated content, to sift, sort, and share information about travel planning and buying. Imagine if you could somehow use all of the collective travel planning knowledge of everyone that has gone before you, effectively eliminating all of the dog-eared journals and notebooks, all of the underlined notes in travel guides. Well, this is exactly what is beginning to occur with tagging.

Suppose you are considering going on a trip to Venice. Naturally you start your online travel planning journey by searching online for “travel to Venice Italy,” where no less than 19 million page links are returned. Perhaps you refine your search, and begin to visit some of the referenced pages. As you visit these pages, you mark or “tag” them in a process similar to identifying browser favorites. Here’s where tagging gets interesting. When you tag a page (e.g., with a service like Del.icio.us [www.delicious.com]), you can annotate the tag with a note or reference, helping you to remind yourself why you tagged the page when you return later. Perhaps you tag a museum with “must visit … Monet painting,” or “hip sushi restaurant.” As you go along creating tags, a ‘tag cloud’ is created, highlighting the areas of interest that your tagging is generating, which can be used as the anchor point for future searches and tags.

Many of these same tools allow you to organize your tags into specific folders and categories (e.g., wine, food, museums and scooter rentals, for your Venice adventure), so that you can refer to them later (perhaps to decide on which restaurant

to actually visit). Del.icio.us calls this collection of tags "bundles," and they form the basis for sharing with others.

The network effect kicks in when you post your tags. The next person who comes along planning a trip to Venice can search for other people's tags of Venice instead of just entering search terms. They discover your tags, and reviews, and sift through information on an order of magnitude faster than starting from scratch. If you are planning a trip in conjunction with a friend or family member, you can invite that person to be a 'buddy' or 'friend' and see your tag collections and cloud so that they can discern if your tags are worth exploring and can help the buddy find that ideal place. In order to make linking more powerful, the number of times others include your tags are tallied as a sort of popularity index.

Another site, Rojo (www.rojo.com), takes a slightly different approach to tagging. Instead of merely tagging pages, Rojo provides a search feature across RSS-enabled news, syndicated articles (e.g., Tripso [www.tripso.com]), and individual blogging sites (including Flickr [www.flickr.com] images, and video or mobile blogs), to give you access to unfettered reviews and stories about local places at a given travel destination. Again, as you identify relevant travel planning info (e.g., restaurant reviews) you can tag it with descriptions, but you can also rank the content so that others can see not just the quantity of tags, but the perceived value of the tag as well (Rojo calls this feature adding "Mojo" to your tag). Along the way, as you accumulate tags, Rojo attempts to assist your travel planning by recommending additional feeds and tags to collect. Finally, once you have aggregated your tags, you can click one button to create an RSS feed that your friends can subscribe to (a great feature if you are anointed group travel arranger).

Speaking of group travel planning, Triporama (www.triporama.com), a service specifically designed to make group leisure travel planning easier for friends and family, has also joined the tagging fray. Included in the many useful travel planning features (e.g. calendar coordination) offered by Triporama, their 'bookmarking button' enables any member of the group to tag pages on the fly as they research travel about their upcoming trip, automatically saving them to the group's trip page, thus eliminating the need to send the "check this out" or "maybe we can go here" email.

How do all these sites make money? The same pay-per-click 'ad sense' model as Google, but the difference here is that site visitors are more qualified, as they are already part of a folksonomy[7]. Folksonomy users often discover the tag sets of another user who tends to interpret and tag content in a way that makes sense to them. The result, often, is an immediate and rewarding gain in the user's capacity to find related content. Travel marketers can leverage these sites to increase revenues by matching their services and offerings, via tags, to travel planners through promotional advertising, as well as insuring that their sites can be easily tagged.

Tagging is a relatively new Travel 2.0 phenomenon that is still finding its legs. Although burgeoning, the utility of this service is powerful and quite easy to take

[7] A detailed description of Folksonomy is located in Alby (2007, p. 117 ff).

advantage of. While only a few sites are mentioned here, there are several others (e.g., general-purpose tools: Shadows [www.shadows.com] and Plum [www.plum.com]; and travel-specific sites: Gusto! [www.gusto.com] and TravBuddy [www.travbuddy.com]) that do not just support tagging, but also include collaborative filtering in order to help users sift through other people's tagging efforts for relevance. Some sites that have been previewed to PhoCusWright allow users to tag price searches in addition to content, to fill in even more of the travel planning and buying process (Offutt, Schetzina 2006; Bray (2006c)).

5 Mapping and mash-ups

Online mapping has garnered a great deal of attention in the past year due to innovations in map functionality, enhanced interactivity and the trend among mapping channel providers to release free application programming interfaces (APIs). Google, Yahoo!, Microsoft and MapQuest have all recently released mapping APIs; both novice and professional developers have used them, to varying degrees, to create mapping mashups: combining data, mapping and other services to create hybrid applications that are changing the way corporations and Internet users interact. Each of these mapping channel providers is tied to a large network of consumers and each is well positioned to provide its users with interactive applications, free development tools and community-based Travel 2.0 services.

For travel companies, the mapping channel providers serve as both partners and competitors, and their applications and success at integrating maps with other services will themselves likely serve as a road map for future development. This Scoreboard compares the mapping channel, free API and business offerings of Google, Yahoo!, Microsoft and MapQuest, describes their impact to date on mashup development and assesses their success at integrating maps with other products and Travel 2.0 efforts.

The history of mapping has been impacted in two separate waves by the Internet in recent years. First, in the early 1990s, when the mapping channel providers initially began to come into existence – and again, when innovative Web design from some of those same providers brought a new phase of attention and development to online mapping.

Online mapping technology trends are today being driven by these mapping channel providers. As more travel companies take advantage of the ease with which they can incorporate robust mapping services into their Web sites, the mapping channel providers grow in importance, setting the bar for measuring mapping prowess, and, in many cases, providing the technology behind the maps that are appearing on many travel-specific Web sites.

The mapping channel providers provide an array of services to consumers and developers. All provide mapping services on a consumer site, free public mapping application program interfaces (APIs), and Microsoft and MapQuest provide

branded mapping products and services for business. Notably, though, it is impressive consumer mapping applications that have brought about the mapping interest that exploded in the past year, with Google maps leading the way.

Google's release of Google Maps and Google Earth spawned a new phase of creative mapping development and has motivated competitors to respond with improved interfaces, an enhanced user experience and opportunities for user development and interaction. Travel companies seeking to integrate maps with other Travel 2.0 technologies should be watching closely as the leading channel providers integrate their mapping applications with other products and services – and as independent developers find new ways to mix and match various APIs, data and travel-related services online.

5.1 Case study: Google Maps

Google Maps was beta launched in February 2005 and immediately garnered attention, due to its impressive use of Asynchronous JavaScript and XML, commonly referred to as Ajax. Unlike earlier online mapping applications, which require users to wait for a page refresh each time a new map is displayed, Google Maps takes advantage of asynchronous communication with the mapping server to provide end users with the ability to click and drag maps to navigate and zoom without a page refresh. The end result is a Web application that performs much

Fig. 1. Google Maps

like a desktop application – providing users with a quick, seamless and highly interactive experience (Figure 1).

By April 2005, Google had integrated Keyhole, the digital mapping service it acquired the previous year, into Google Maps. This enabled users to select satellite mode to navigate a digital view, created using satellite and aerial photos. Several months later, a hybrid view was introduced, overlaying map data onto the satellite view (Figure 2). In June, the company released a robust version of the satellite-based mapping tool in a new product called Google Earth.

Fig. 2. Google Maps hybrid view

From the beginning, users of Google Maps could enter a search term (e.g., hotels near LGA) and see plotted results. In October 2005, in an effort to emphasize the integrated searching capabilities, Google officially merged its local search site with Google Maps, calling the integrated product Google Local. Google later reversed this move in response to user feedback and changed the name back to Google Maps.

Also in 2005, Google enhanced its mobile services to make Google Maps (then Google Local) available via mobile Web browsers and driving directions available via SMS.

Enthusiastic hackers started creating client-side scripts for customizing Google Maps soon after it was released, and in June 2005, Google released the free

Google Maps API to the public, enabling the creation of numerous mashups. In June 2006, Google launched the fee-based Google Maps for Enterprise.

Google uses San Jose, the Calif.-based deCarta's Drill Down Server geospatial software platform, and obtains geographic information system (GIS) data from NAVTEQ and TeleAtlas. Medium-resolution satellite coverage is via NaturalView Data from MSA Federal, and high-resolution satellite images (available for 20% of the globe as of June 2006) are provided by Digital Globe. Sanborn provides digital aerial photos, with some additional data obtained from government sources.

Google Maps was created in house using the open source AjaXSLT framework, an implementation of XSL-T in JavaScript that runs in the user's browser, providing for the transformation of XML documents locally – resulting in reduced bandwidth consumption and increased speed.

Google released the Google Maps API in June 2005 to enable developers to create programs designed to interact with Google Maps. In fact, developers had already begun incorporating Google Maps into their Web sites, and Google wisely embraced this trend, offering them support and documentation.

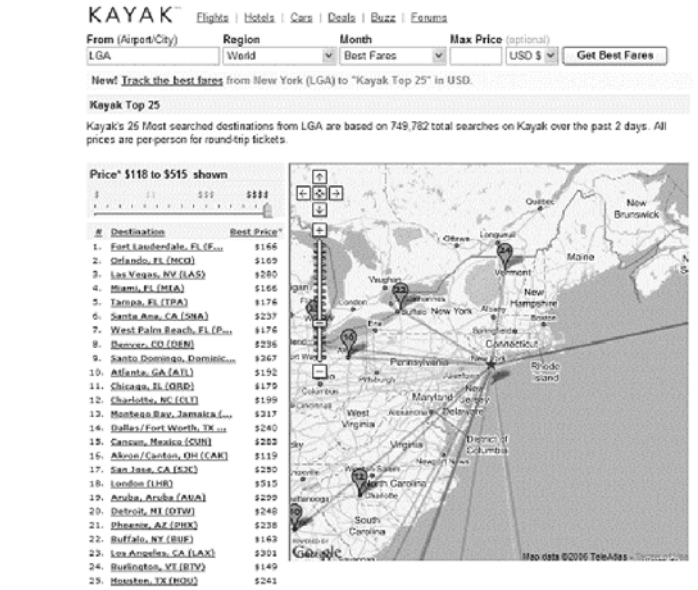
The Google Maps API enables users to embed Google Maps into their Web site using JavaScript and is available free-of-charge to both noncommercial sites and commercial sites, provided they are free to consumers. Developers can add overlays, display information windows and customize controls. In June 2006, geocoding capabilities were added to the Google Maps API, making street-level geocoding available for the U.S., Canada, France, Italy, Germany and Spain. Google Maps for Enterprise now offers mapping via a fee-based enterprise license and provides support for internal or fee-based Web sites and applications.

Several travel companies have integrated maps into their Web sites using the Google Maps API. Kayak, for example, has incorporated Google-powered mapping mashups into its Fare Buzz tool, which enables users to view low airfares originating from an airport of their choosing (Figure 3); and FareCompare has used Google Maps to integrate Destination Deal Maps into its Web site. Other travel-related mashups include TripMojo and ReserveMy.com, with more on the way, including an upcoming Google-based mashup from Home&Abroad (www.homeandabroad.com).

Beyond the Maps API, Earthbooker.com, part of GlobeAssistant BV, plots hotel locations into Google Earth and Google Maps. Powered by Hotels.com, Earthbooker combines hotel data with Google Earth's satellite imagery to map 80,000 hotel locations.

Google's flagship service is its Internet search engine, which provides access to billions of Web pages. In addition to Internet search, Google provides end-user tools for: Web based email (Gmail), comparison shopping services (Froogle), message boards, Web logging tools (Blogger), photo sharing (Picasa), instant messaging (Google Talk) and others.

Although Google has made an effort to integrate Google Maps with local business information, it has not focused on integrating maps with other products to the same extent as Yahoo!. With a simplicity similar to the clean interface on the company's home page, many of Google's products stand alone, rather than being



Source: PhoCusWright Inc.

Fig. 3. Kayak Google Maps mashup

integrated into a more multifaceted, multipurpose application like Yahoo!'s Trip Planner. Google's stated goal of organizing the world's information and making it universally accessible and useful seems to hold true in its mapping strategy; its tools are designed with a clear goal and an obvious utility in mind.

To that end, Google has developed several new products based on Google Maps. Google Ride Finder, which is available for major U.S. cities, leverages GPS systems in participating taxi and limousine services to display their current locations. Google Transit, currently only available for Portland, Ore., helps users plan their route using public transportation. Both products are currently in Google Labs (http://labs.google.com).

Since releasing Google Maps, Google has focused on optimizing integration with local information and expanding the availability and quality of satellite images. Google has also been developing its mobile offering, and in July 2006 enhanced Google Maps for Mobile to provide real-time traffic information on mobile devices.

5.2 Product evaluations

Google's innovations and dominance as a channel provider have clearly driven the competition and their market offerings – but the story doesn't end there. Google, Yahoo!, MSN and MapQuest each have competitive advantages to build on, and

each has a loyal customer base linked to large social networks that are being buoyed by the release of Web 2.0 products and services.

The Google Maps API was clearly a huge win for the company, as it was the first free mapping API release to leverage the power of RIA programming. As a result, it garnered much attention among developer communities and became the gold standard against which the other APIs are measured. The Google Maps API continues to be the most popular among developers, evidenced by the impressive number of mashups it has spawned, as analyzed by ProgrammableWeb (www.programmableweb.com), a site that tracks Web 2.0 development. The Google Maps API, in fact, appears to be the most popular among APIs in all categories.

While mashups and API popularity are paramount in the developer community, these factors do not necessarily translate into general consumer use. MapQuest continues, by most measures, to dominate its competitors in terms of site visits. Recent data released by Hitwise put MapQuest at the top of the heap, with 56 % of mapping traffic, versus 21 % percent for its closest competitor, Yahoo!.

Market shares fluctuate somewhat, but Hitwise's rankings suggest that a sizeable number of consumers value factors other than a cutting-edge interface when choosing an online mapping service. MapQuest also dominates in the mobile realm, with MapQuest Mobile ranking as the top revenue-generating downloadable mobile application. According to mobile research firm Telephia (www.telephia.com), MapQuest captures 22 % of all revenue from downloadable mobile applications (not including mobile TV or game applications).

As Web 2.0 comes to fruition, robust user interfaces and integration with other products and services will prove increasingly important. This means not only must the mapping channel providers integrate maps with their own internal offerings, but they must carefully plan their strategy for encouraging external use of their APIs and mapping development tools while still monetizing the services they are offering.

Each of the channel providers is working to strike a balance between encouraging social development and protecting their core, for profit mapping offerings. Google, known for its free products, and Yahoo! have provided the most open API terms and Microsoft has encouraged development with its free commercial API, while maintaining restrictions that benefit MSN search. MapQuest, a strong enterprise player, has chosen to forbid commercial use of its free API altogether.

On the Web 2.0 side, Yahoo! and Windows Live Local have been the early winners at integrating their mapping technology with other tools and services, including social networks, blogs, photo sharing and personalization initiatives. Google's Web 2.0 efforts have been primarily discrete offerings that, to date, have not focused on integrating into community sites like those Yahoo!, AOL and MSN have worked to create.

Meanwhile, Google and AOL continue to solidify their alliance, while Microsoft and Yahoo! cautiously solidify theirs. Recently, Microsoft and Yahoo! an-

nounced that they will enable instant messaging subscribers to communicate across their respective networks, although they will not share email.

By virtue of the technologies they have helped develop and the breadth of their advertising and other linkages between businesses and consumers, the large channel providers have sown the seeds for the emergence of thousands of smaller third party Web portals. Smaller Web portals are repackaging and leveraging mapping capabilities offered by the major channel providers to provide novel, value-added services in the travel and tourism industry. Tourism bureaus, car rental companies, hotels – in fact, all types of travel-related businesses – are augmenting their Web sites with mapping capabilities as a means to capture the public's attention and to convey information about their products and services.

As Travel 2.0 continues to develop, the innovation and experimental Web 2.0 efforts of the mapping channel providers and their corresponding portals will serve as a very visible indicator of the emerging Web environment, as a new kind of relationship between companies and consumers is forged. Mapping has emerged as a key organizational schema for the next phase of online development, and its relevance to the travel space is undisputed. Travel companies in all sectors should watch closely as Google, Yahoo!, Microsoft and MapQuest evolve to gauge consumer expectations and to identify and capitalize on location-based content and services[8].

6 Rich media

Rich media has the potential to counter commoditization, sell location and dramatically enrich travel planning overall. With broadband penetration on the rise, rich media not only has the potential to differentiate hotel rooms, but enables companies to leverage sound, animation, real-time video and interactive maps to help consumers to visualize the travel experience.

The technical challenges of making it searchable, accurate and up-to-date remain. Steps are being taken to standardize rich media coding, but as with all standardization efforts, it takes time for standards to become pervasive. And despite a clear vision of the future potential of mobile rich media, there are still a number of infrastructure and content challenges to be addressed. Challenges that many argue will take years, not months, to overcome.

TRAVDEX@ITB also held a panel discussion on rich media's impact on hotel buying. Philip C. Wolf, President and CEO of PhoCusWright Inc. interviewed Remzi Zafer Aru, Managing Director, GIATA GmbH, Neil J. Hucksteppe, Executive Director, Technology and Managing Director, Asia Pacific, Leonardo Media BV and Victor C. Robison, CTO, VFM Interactive Inc..

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[8] Taken from Piliouras/Schetzina (2006).

A hot topic in the market today is rich media's impact on the shift in research and buying. The technology challenges are enormous and rich media is currently not searchable. What are GIATA, Leonardo Media BV and VFM Interactive Inc. doing to make rich media searchable?

GIATA has created hotel text in 8–9 languages to optimize and keep search results on the highest level. GIATA also uses text tags or meta-tags for rich media. A huge amount of information is in flow. GIATA also sees the need to deliver information to mobile phones. No one wants it yet, but in the future it could become a very attractive market.

Leonardo Media BV works on the simple side. They take information from the hotel and distribute hotel text content. Leonardo Media BV indexes the content, stores, manages and supplies it in an XML feed. They rely on content-agnostic information for all partners.

VFM Interactive Inc. states that metadata is searchable and thus annotates photos with searchable text. They add keywords and pass the data to distribution partners. In the future, there will be automated methods to determine content. Voice recognition technology is in the making. VFM's transcripts are compiled with a NSA. In a direct search with Microsoft, VFM can create and determine if a photo is indoors or outdoors for example.

7 New applications beyond the browser

Just when you thought your Web site, electronic channels and email marketing were optimized, a whole new collection of online communication options have surfaced. Many of these do not depend on the typical Web browser. Whether it's SMS, RSS, IM or other new applications, business success now demands that you develop "beyond the browser".

Online research has even penetrated the travel industry. And broadband use has grown at a very fast pace. Browsers enable travel booking. However, the look to book ratio remains low. Some sites have even been online for 4-5 years. This growth leads to an emergence of several metasearch sites such as fourpoints.com, who converted their page to front. Users now have great possibilities for searching online and finding matches to their queries. However, to make an analogy, this is just another metro stop along the way. Although consumers often consult search and metasearch applications online, may still shop at travel agencies. It is a continuous tug-a-war. In addition, there is little loyalty in online buying. Online travel purchasers normally do not have preferred sites. Currently, customers' access to search is like a Turkish bazaar: you never know what you will find around the next corner. As an industry, we need to bring loyalty into the system.

In earlier versions of the Web browser, it was like having a telescope. Users could easily navigate their way through the online information to find the rele-

vant information. Now, with more content, the browser acts as a telescope turned around – the customer gets lost in this lack of focus, leading to promiscuity in the travel industry. Suppliers and travel distributors cannot drive customer loyalty, yet nevertheless need to look for ways to further customer loyalty online and offline.

Southwest Airlines (www.southwest.com) has developed such a system, dinging potential customers with special online offers (ding being the sound of a doorbell ringing). The program can be downloaded from the Internet and placed on the user desktop. Currently, over 1 million users have taken advantage of this application. Southwest sends out information when best fares are available, thereby implementing a persuasive way to market and push online bookings. Users don't have to search for information on the Web; Southwest sends the information automatically. Essentially, this program works like Pavlov's dog: Users become accustomed to the dinging sound meaning an amazing online offer for cheaper flights has just arrived and they go scurrying off to check it out.

Portaga (www.portaga.com) provides travel distribution through the calendar application. A user simply has to schedule an appointment in his calendar and click on travel meeting. The program then applies the user's personal preferences to check for the best online fares. After searching the Internet, the program sends an email to the user, listing proposed itineraries and results. This is not an open browser program – it runs on a separate network and sends the results via email, so that when the user goes online to check his email, he can look through the generated itineraries.

Another innovative travel technology is travel from car. Using a screen located on the dashboard, users can establish a two-way communication. With this application, users can book rooms in local hotels, make dinner reservations etc. all from the comfort of a dashboard consol in the car.

Google Earth has also come up with innovative ideas. This application is great for booking hotels and making maps. Distributors and suppliers provide information. Users can then use Skins to locate preferred hotels and get travel information to that location. Earthbooker (www.earthbooker.net) applications allow users to choose the hotel they want and buy directly, promoting hotel bookings. The application uses satellite image maps.

Start.com (www.start.com) is a preview version from Microsoft using widgets and subscribing to RRS feeds. We can add feeds, news etc onto start.com. Contabulator is a Yahoo application with Web cams in travel destinations. Contabulator, octopustravel and AIM (AOL Instant Messenger) are direct onscreen programs and not browser-based.

As we can see, there are a lot of new application getting between the browser and the consumer. Companies are coming up with new ways to demonstrate products.

8 Case study: RFID and the future traveler

Despite tremendous increases in passenger volume, security related challenges and logistics around queues, seats, bags and the like, traveling can actually get easier. Technology applications focused on improving the individual traveler's experience are just around the corner.

There are two versions of this technology. First, the reader sends a signal to a non-powered device. This device then sends a response signal to the reader. And can actually send back information upwards of 1 K to the reader. A drawback is of course that the signal encounters problems and issues when used in proximity to metal. Furthermore, the reader has a signal distance of 5 to 10 cm, making it impossible to scan devices located 10 meters away for instance. The second one is a smart card to be used for contactless payment. To carry out purchases, all the user needs to do is hold his card in front of the reader and then enter in a PIN.

RFID provides several applications along the traveler service chain.

1 *Distribution*. What we see for the future is smart posters with RFID chips located for instance in airports. For example, a traveler sees a poster with a € 299 deal on a trip to London. By holding the mobile phone in front of the smart poster, this traveler can transfer details to his mobile phone, then actually book this package using a direct connect to the Web site, and even tender payments via mobile technology.
2 *Check-in process*. In the future, travelers will be able to transfer electronic ticketing data onto their mobile phones at home, then transfer the data from the mobile phone to the automated check-in terminal at the airport, thus accelerating the check-in procedure.
3 *Fast-tracking security.* Future trials for the RFID technology are to be included in the passport. RFID will be enabled for passports in the USA.
4 *Facilitating boarding.* Before boarding a flight, boarding information can be transferred to a mobile phone and to an on-board machine. The flight attendants will then receive detailed information for the traveler's preferences during the flight.
5 *Hotel check-in and payment.* Checking-in could occur via a mobile phone; data will be transferred to the hotel reception with no physical contact taking place. On departure, the hotel will simply transfer receipts to the guest's mobile phone.
6 *Smart Poster.* Perhaps the most impressive RFID application is the Smart Poster technology. By scanning a Smart Poster containing travel advertisements with a mobile phone, a Web browser will automatically open. From there, a user can search for more information regarding the particular deal or book this deal directly. Or, take a poster advertising a vacation package where travelers can swim with dolphins. Using the RFID technology, people

can transfer and initiate a MPEG file from the poster. This technology can also be implemented in virtual hotel advertisement displays, allowing the user to view the hotel and even book a room. So far however only prototypes have been produced. Datalex is using leading edge technology in pioneering partnerships with Philips and Sony. The technology cannot yet be used; however, trials have been held in 2006 at G.F., Atlanta, Georgia.

Currently, technology poses certain challenges; however, in time implementing this technology will become easier. Right now, RFID is a pioneer technology and still need work in the compatibility section. Additional near field technology devices (NFC) have to be developed. As for privacy and security, mobile phones will be equipped with a RFID disable function. The user will even be able to permit certain reader definitions.

The benefits of such a technology are practically limitless. In the future, the mobile phone will become the Swiss army knife of the next generation. The mobile might just become the one device you never leave home without.

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