GigaOM PRO

Google's Mobile Strategy:
Enable Innovation, Boost Access

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immr

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Introduction

Mobile communication is one of the most complex engineered systems imaginable, encompassing hardware, software, networks, services, applications, app stores and other pieces, all of which must be carefully integrated and managed to work as expected. Given all the interdependencies, user experience is often determined by the weakest link in the chain. Over the last 2-3 years, advances in key links — network speed, UIs (user interfaces), devices, and applications — have improved significantly, fueling a "virtuous spiral" and unleashing pent-up demand among users.

Despite these advances, operators continue to control much of the mobile value chain. As observed in other industries, incumbents' efforts to maintain their position and maximize ROI have slowed innovation. As a result, while the industry is on the cusp of new and exciting developments, mobile is still in its infancy, not unlike television in the '50, before color sets, cable, satellite and DVRs appeared and transformed the media landscape. Our view is backed by a recent widely publicized study that likened mobile — in terms of usability and user experience (UE) — to the Internet circa 1994. More evidence supporting this view is presented in a subsequent section.

Many individuals outside the industry also believe mobile is ripe for innovation. As Eric Schmidt, Chairman and CEO of Google, said in 2007, "Consumers deserve more competition and innovation than they have in today's wireless world."

We believe that Google, along with other companies challenging the status quo, will shift the S-curve of innovation and adoption forward, enabling advances to happen sooner, faster and on a wider scale than would otherwise occur. By definition, disruptive innovations are usually at odds with incumbents' interests. As a result, the legacy mobile business as it exists today is likely to be transformed significantly. Building on the earlier GigaOM Pro research note, "Will Google Lead the Way in Mobile App Innovation?" this research note describes elements of Google's current mobile strategy and outlines areas where Google is likely to focus in the future.

Google's Vision for Mobile

Google, of course, is not alone in its quest to accelerate innovation and change in mobile. Other large companies, notably Apple, Qualcomm and Intel as well as many startups are also aggressively pursuing opportunities. Still, given the scale of Google's efforts and its success disrupting legacy business models in other categories, we believe Google is uniquely positioned to reshape the mobile industry. Google Ventures has allocated $100 million to fund startups this year alone — with its deep commitment to Android and other mobile initiatives, Google has emerged as one of the leading investors in mobile.

To be sure, Google wants to extend its search capabilities and ads to mobile devices — however, this represents only part of the rationale for Google's interest and investment in mobile. Google recognizes the enormous, pent-up demand for mobile and believes it can (i) create a compelling array of new services, and (ii) capitalize on opportunities with disruptive new business models. In our view, Google's intent is to remove obstacles that interfere with individuals' ability to access and enjoy content (broadly defined) and applications on mobile devices anywhere, anytime. Its goal, an ambitious one to be sure, is to ensure that end-users aren't blocked or their experience compromised at any step along the "customer value chain." In pursuing this goal, Google is assuming the role of "platform leader" — in essence, addressing and attempting to solve or at least mitigate the impact of any weak links in the mobile value chain.

Isn't the Status Quo in Mobile Working?

While the mobile industry has made considerable progress, the following examples illustrate the kinds of issues which, taken together, support the contention that the status quo is lacking:

- Households with both landline and mobile phones — admittedly, a shrinking group — continue to deal with the vestiges of different phone numbers, multiple voice mailboxes, etc. As a result, "phone tag" and "missed calls" make

communications difficult for many. Legacy landline networks — aptly called POTS, for "plain old telephone system" — and "home phones" that have changed little over the last two decades exacerbate the problems.

- A majority of consumers subscribe to broadband, and a majority of broadband subscribers have Wi-Fi in their homes. Still, only a small percentage of mobile handsets in the U.S. work on Wi-Fi. In fact, until very recently it was not uncommon for operators to disable Wi-Fi functionality on so-called “dual-mode” handsets, making it impossible for consumers to use their mobile handset on Wi-Fi networks either at home or in public hot spots.

- Although 3G and 4G networks deliver mobile broadband, in many cases operators either prevent or make it difficult for mobile data subscribers to tether laptops or netbooks to their mobile handset, requiring customers instead to purchase a separate mobile data card.

- At $1.00 or more per minute, international calls on a mobile phone are cost prohibitive, forcing customers to use calling cards, services such as Skype (also blocked by some operators), and other "work arounds." MetroPCS’s recently announced Unlimited International Calling plan for $5 per month is a shot across the bow for incumbent operators.

- Research conducted by immr reveals that nearly 1 in 3 consumers are dissatisfied with the reliability of their mobile phone service inside their home. To remedy the problem, operators have developed and are offering femtocells to mobile phone customers — with a price tag of $10-20/month, early results indicate that consumers are balking at signing up for femtocells.

- Nearly two-thirds of households record programs on their DVR for viewing at a more convenient time. For the average consumer, figuring out how to "sideload" and view recorded content on their mobile device remains quite a challenge, requiring assistance from the GeekSquad or its equivalent. In the

meantime, operators are promoting services that rely on OTA (over-the-air) transmission of video and other content.

- Of course, the list wouldn't be complete without noting the cost of mobile data plans — at a cost of $50-60/month, mobile broadband remains out of reach for the average consumer.

These issues illustrate the Mobile Innovation gap — a more complete list includes issues that are merely annoying to obstacles that make mobile use difficult, counterproductive, and either impossible or prohibitive.

Despite progress to date, the status quo in mobile is still far from ideal. Of course, incumbents can cite reasons for each of the above, and we admit that some — such as DRM — represent formidable challenges. Nonetheless, the significant, pent-up demand for mobile without constraints is feeding a flurry of development efforts within large companies and startups — their aim is to develop new services and build businesses that remove the barriers and unlock demand among mobile users.

Google's Efforts to Unleash Mobile Innovation

In contrast to the Internet, the mobile value chain has historically been a closed system, with mobile operators more or less specifying the devices and even the applications that run on their networks. In one sense, this is analogous to an ISP (Internet service provider) specifying the type(s) of PCs and modems that customers can use, and perhaps even influencing the ease with which customers can visit various web sites.

While operators have begun to move away from the "walled garden" approach that was common only a year ago, mobile is way behind the Internet in terms of embracing open innovation. For its part, Google is attempting to steer mobile innovation more along the lines of the Internet through a number of initiatives. These efforts are intended to promote standards that enable, at a minimum, interoperability, but more importantly, accelerate the rate of innovation. The following is a brief summary of key

initiatives:

- **The Open Handset Alliance** — The Alliance is a consortium of leading mobile companies brought together by Google to foster "greater openness in the mobile ecosystem" and "accelerate innovation." With 47 members, including chipmakers Intel, Qualcomm, and TI, OEMs Motorola and HTC, Acer (3rd largest PC manufacturer in the world), Vodafone, touch-screen manufacturer Synaptics, and others, the Alliance has emerged as a significant force in the mobile industry.
- **Android OS (operating system)** — Google has invested more than 300 years of staff time developing Android, the open OS for mobile devices. By eliminating license cost and offering programming efficiencies, Android — after a slow start — is quickly gaining favor among OEMs. In July 2009, HTC, the world's fifth large mobile handset manufacturer, announced that more than half of its devices will be built around Android. Needless to say, this is a remarkable accomplishment for Google. Perhaps even more important, Android is attracting developers who want to leverage Android's open architecture and APIs in new and compelling ways. While Apple's App Store has generated a groundswell of interest among developers and spawned an enormous number of new mobile apps, Google believes that its open source strategy will produce an even greater wave of innovation over time. As Google's Andy Rubin pointed out in an interview last year "web-style innovation … is an awesome way to develop."
- **Google Gears** — as described more fully below, Gears provides a platform, environment, and set of tools that reside "in the cloud," enabling developers to create and introduce new versions of apps much more rapidly and at a lower cost, compared to App Stores and other models. While there's considerable debate over their contention — and in fairness the jury is still out — Google believes that web-based apps represent the quickest, most efficient path to accelerate mobile innovation.
- **Google Services** — Google continues to develop and extend its own branded services for mobile. For example, Google Maps recently announced a new

feature that allows individuals to view not just nearby POIs (points of interest, such as businesses, attractions, etc.), but transit lines and other location-specific information useful to mobile users. Goog411 and Google Search, now speech enabled, are other popular G-branded mobile services.

These key initiatives are designed to (i) accelerate mobile innovation and (ii) give users a wider choice of mobile devices at a range of prices, with access to an even wider range of compelling new apps.

Google: A "Frenemy" for Mashups?

By extracting and combining data from multiple web sites in new and interesting ways, mashups have proven useful to consumers and businesses. Mashups developed to date represent the beginning of a seismic shift, and we predict that the number of mashups will grow exponentially, particularly for mobile devices and usage situations.

In mobile, mashups have become more and more popular for a number of reasons:

- While mobile, individuals often need answers to questions, such as "When does the movie start?" "Which gas stations are nearby?" (see for example GasBuddy); "Which nearby restaurants are best?" and even "What does the person with whom I'm meeting look like?" Mashups on mobile devices provide almost a "lifeline," making it easy for individuals to find information and make decisions while on the go.

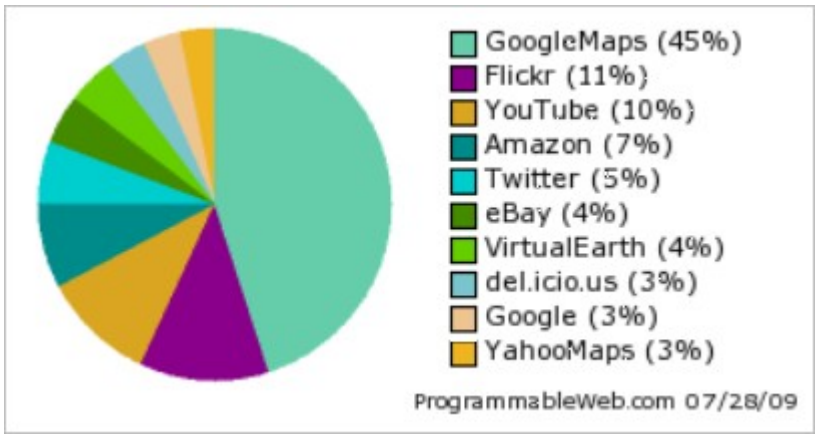
- Compared to search engine results, mashups provide more direct and easier access to answers, an important advantage on mobile devices with small screens, where navigating, clicking, and moving between screens is more difficult.

- Because mashups are web-based and remix existing data, they are economical to produce, host and deliver.

- Similarly, as a web app, mashups can be accessed by users on any device with Internet access.

Given the importance of geo-location data, it isn't too surprising that nearly half of the mashups produced to date — in general, not just for mobile — involve maps in some fashion (see below).

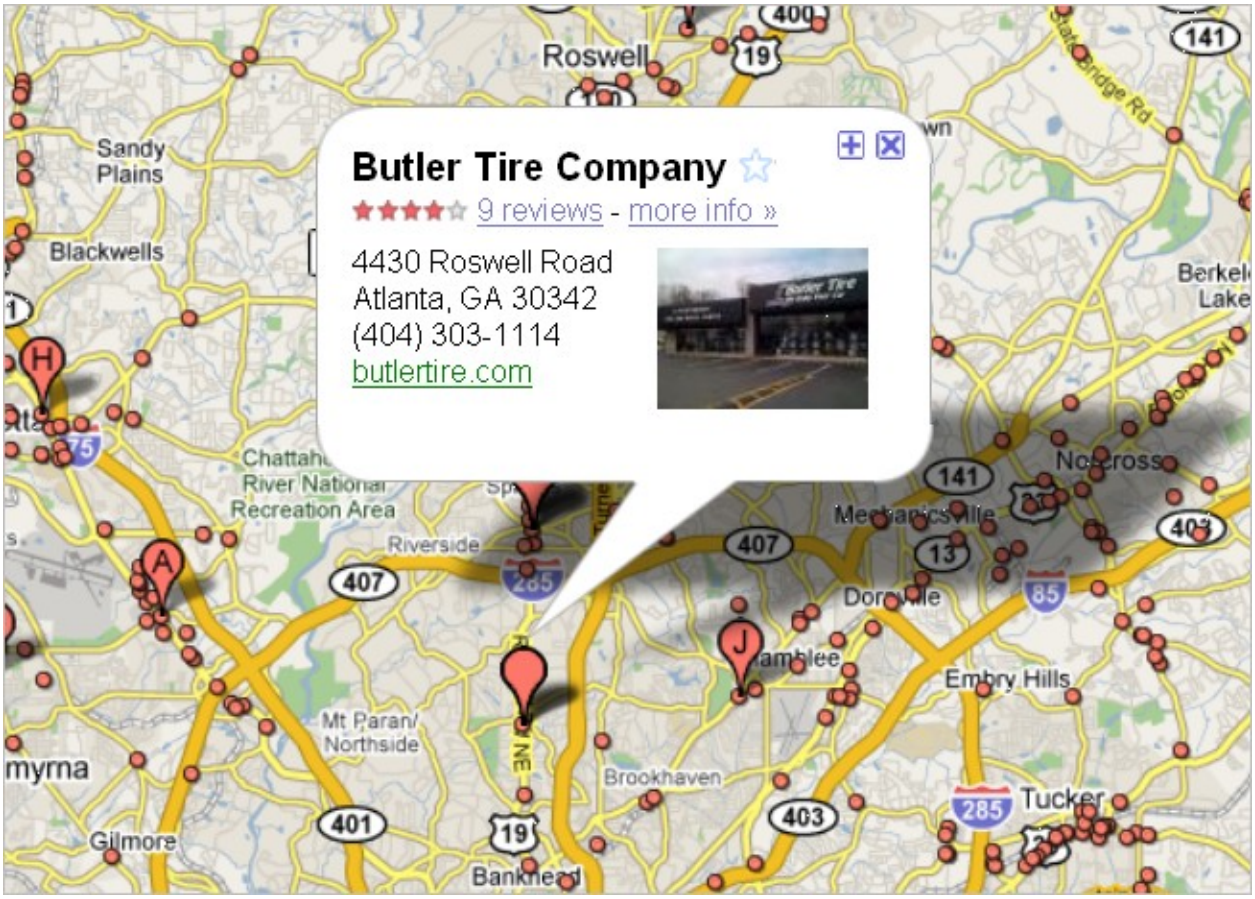
Figure 1: Sources of Mashups as of 7/29/09



Source: ProgrammableWeb.com

Interestingly, the idea for these mashups didn't originate with Google or Yahoo — instead, it came from hackers who figured out how to reverse engineer both mapping services. One of the first applications developed by hackers layered listings for housing from Craigslist onto Google maps. After getting past their initial surprise, both Google and Yahoo recognized the potential, opened up APIs, and began to promote and make it easier for developers to access and incorporate geo-location data into their mashups. Google and other mapping providers have also assembled additional information that complements the geodata — for example, hours of operation, user reviews, images and other useful information, as shown in the illustration below. Such location-specific data significantly enrich mobile users' experience.

Figure 2: Example of Enriched Information on Google Maps



Source: Google Maps

Although Google and Yahoo opened up their geo-data at about the same time, Google now dominates, providing location data and maps for over 90 percent of all mapping mashups, compared to less than 10 percent for Yahoo. Interestingly, Mapquest, an early leader in online maps and directions acquired by AOL in 2000, doesn't even appear on the list.

From its experience with Google maps, Google clearly learned the value of fostering mashups within the developer community. Just as it has become the dominant supplier of geodata, we believe Google is uniquely positioned to extract, aggregate and make available to developers many other types of data.

Of course, other competitors are vying for this market. Two new search engines — Microsoft's Bing and Wolfram Alpha — focus on extracting "facts" from the vast amounts of data on the web — both recognize that mobile users generally prefer answers, rather than search engine results that they must sift through. In addition, other companies, such as Siri, are developing innovative new solutions that extract information from the "deep web." Finally, Kapow and other companies are providing tools that can be used to create much more sophisticated mashups than seen in the first generation — these advanced mashups are capable of automating virtually anything that an individual can do in a browser.

Thus, we're likely to see many more advanced mashup-like solutions from other developers, extracting and remixing a wider, richer range of data. To appreciate the range of applications, view the list of more than 1,400 companies and sites that provide APIs for mashups on the directory at Programmable Web. In addition to consumer applications, mashups aimed at enterprises are gaining a lot of momentum (see Mashups turn into an industry as offerings mature), although security, integration, and other challenges make it much more difficult.

In addition to enabling mashups, Google continually evaluates opportunities to develop its own, Google-branded services that in some cases compete with developers and service providers. For example, while most real estate listing services use Google maps, Google has also begun to aggregate and show listings from MLS, newspapers, Craigslist, and other sources. It isn't too surprising that Google is developing its own G-branded services. After all, its mission is to “organize the world's information and make it universally accessible and useful.”

Much as it has monetized SERP (search engine result pages), Google is also monetizing map views with a variety of options for advertisers, leading one observer to coin the term "mapvertising." (Money, Ads, and Maps: Is Mapvertising the Key to Monetizing Mashups?) Thus, we expect Google to continue to play the role of "frenemy" — friend and enemy, or at least competitor — with respect to mashups. The

strategy involves facilitating and promoting innovation among developers, while simultaneously pursuing opportunities with Google-branded solutions that it has either developed or acquired. In both cases, Google will leverage and monetize these assets and services through mapvertising and other means.

These efforts will produce a wide range of compelling new mashups that benefit mobile users, advertisers and developers.

Will location data be the new clickstream?

The discussion of mashups suggests the importance and Google's dominance in providing mapping APIs. We believe that geo-location data will prove even more important in Mobile, and that a number of significant new, untapped opportunities exist for Google and other companies. Given the importance, location-aware apps are examined in a forthcoming GigaOm report to be published later in August.

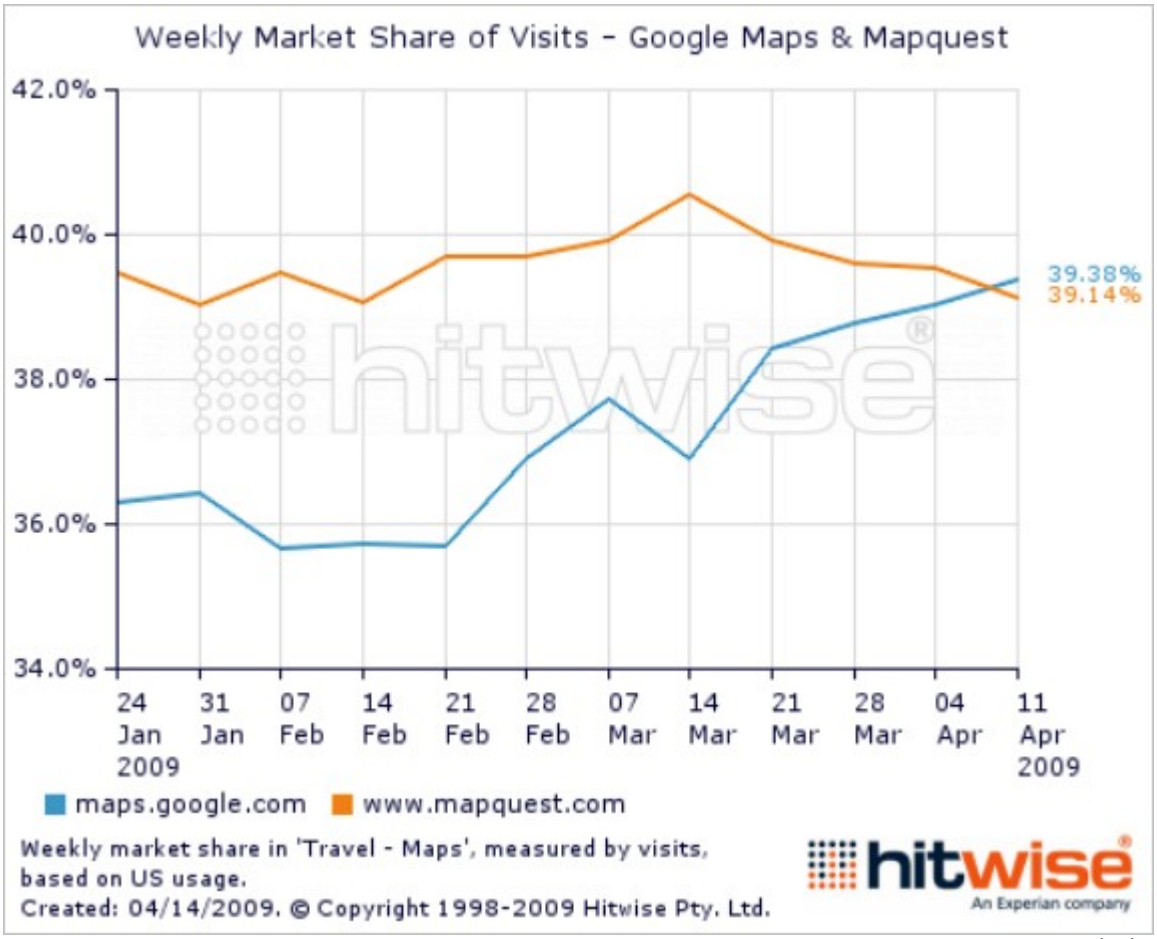
So why is location so important in mobile apps? When using mobile devices, individuals often have a specific purpose and a limited amount of time in which to get something done. One observer describes these as "last mile" and "last minute" situations. Information about a user's location can be leveraged by mobile apps in a number of ways to make it easier for mobile users' to accomplish their goals in these situations — for example, location-aware apps can provide:

- Information (weather, traffic, alerts, etc.) specific to the user's location
- Maps, directions, and other geo-location information
- Images of nearby buildings that help with "wayfinding"
- Information on the location, presence and availability of friends and even strangers with similar interests
- Tools that make it easy to "geotag" photos, reviews, and other user generated content

As noted earlier, Google has developed a strong following by making geo-location data

available to developers for apps in each of the above categories. Google has also been quite successful offering its own branded services — as shown below, Google Maps surpassed MapQuest in April 2009 to become the No. 1 web site for maps and directions. Others Google services, such as Streetview and Latitude, are also growing in popularity.

Figure 3: Market Share of Visits to Google Maps and Mapquest – Jan. 2009 – April 2009



Source: Hitwise

An even bigger opportunity, in our opinion, is capturing, analyzing and leveraging insights from the enormous amount of location-based data that will be generated by location-aware devices and apps. Firms such as Sense Networks, co-founded by an MIT computer scientist and funded by Intel Capital, and others are developing solutions and capabilities to analyze these massive datasets. So how can insights

extracted from individual-level location data be used?

Here are a few examples that suggest possibilities:

- Optimize the layout of public and commercial spaces (store, shopping centers, etc.)
- Establish prices for outdoor and in-store advertising space, based on traffic
- Determine which point-of-sale ads most effectively engage consumers, e.g., persuade them to pause to view a storefront or to enter a store
- Personalize information for individuals based on the routes they (and others before them) take

Google and IBM, especially with its acquisition of SPSS, are among the few organizations in the world that have the computing power, analytical capabilities and understanding to develop and capitalize on this largely untapped treasure trove of data. Of course, another option is to acquire smaller firms with distinctive analytical capabilities. Much as Google extracts and leverages insights from its vast experience in search, we believe it is well positioned to do the same with location data.
Given the sensitivities surrounding users' location data, Google will need to tread carefully, and concerns about privacy and the concentration of too much information in one organization's hands could slow or even derail its efforts.

Who will liberate content?

Many of us remember when content was stored in the equivalent of "lockers" that made it difficult to access, use and share while mobile. Consider the following examples:

- **Photographs** — once printed on paper and stored in albums or shoeboxes — are now stored, managed, and even edited with Yahoo's Flickr, Google's Picasso, and numerous other web-based services.

- **Documents** — Rather than storing and working with documents on PCs,

Google Docs and similar services from Thinkfree and Zoho allow users to store, share, and if desired edit documents online. As Om Malik has pointed out there are significant benefits to managing and storing documents in the cloud, although others have emphasized the drawbacks as well.

- **Video** — As with photographs in years past, much of the video taken by individuals continues to be stored on tape or disc. By making it easy to upload and share short video clips, YouTube — purchased by Google in 2006 for $1.65 billion — has unleashed a torrent of user-generated content. Every minute nearly a day's worth of video is uploaded to YouTube. In the future, YouTube could evolve into a digital repository for storing and viewing user-generated video of any length, and perhaps even commercial video, although the bandwidth and storage requirements would be enormous.

Of course, photos, documents and video represent just a few examples of content that individuals would like to access, view, and use during the day. What about other content that is "locked away," either in physical format — such as newspapers and magazines — or even digital, such as programming recorded on a DVR at home? Google is chipping away at these "content lockboxes," making it easier for individuals to access content on mobile devices while on the go.

- Google News, of course, is one of many competing providers for fresh news, allowing individuals to stay abreast of fast-breaking developments throughout the day

- Google is also in the process of digitizing a large number of printed books and magazines — while the initial focus was on out-of-print books, the scope has expanded to include newer books as well as magazines. In the future, Google and Amazon will provide access to a much wider body of digitized books, images, and other content now stored on "dead trees" — of course, significant issues related to IP and compensation for authors and publishers must first be resolved, as Paul Sweeting describes in his GigaOM Pro report, "Evolution of

the e-Book Market."

Amazon has demonstrated with the Kindle that consumers enjoy access to books and other publications on a mobile device, without having to worry about data usage charges for over-the-air downloads and other issues that plague digital content. As cable companies roll out their wireless solutions, we are also likely to see more solutions that make it easier for consumers to access content recorded on their DVRs or the equivalent "in the cloud." Don't be surprised to see more of these types of applications coming from Google as well.

Finally, there is whole new set of technologies, such as QR (also known as 2D) codes, RFIDs and beacons that will provide information on a scale that we can't yet imagine. It's unclear where and how these vast quantities of information will be stored, maintained and made accessible to users, not just for viewing/hearing but also to add their own comments. However, we suspect that the assets and capabilities that Google is assembling will position it well to play a leading role.

Latency Kills

Or, as Stanford's Stuart Chesire put it, "It's the Latency, Stupid."

The importance of User Experience (UE) on mobile devices is widely recognized. While a recent study by usability expert Jakob Nielsen acknowledges some progress, particularly on devices such as the iPhone, overall findings cast the mobile Internet in a bad light. To frame the conclusion in a way that users can relate to, Nielsen compares the mobile Internet to the Internet circa 1994.

Todd Hoff's recent analysis shows the impact of latency, or how long the user has to wait for a site or app to load, respond, and so on. The following results from leading Internet companies, based on their experience with Internet users in general (not just mobile), underscore the importance of latency.

- Shopzilla's data shows that a 5-second speed up resulted in a 25 percent

increase in page views, a 10 percent increase in revenue, and a 120 percent increase in traffic from Google

- Amazon found every 100ms of latency costs them 1 percent in sales.
- Google found that an extra .5 seconds in search page generation time dropped traffic by 20 percent.

Mobile Internet users may be somewhat more tolerant when it comes to latency, but that surely won't last. In any event, the impact is clear — latency kills. So what are the implications and opportunities for Google and mobile?

Recently Google's VP of engineering, Vic Gundotra, reiterated Google's view that web apps represent the future for Mobile (audio of his presentation at Mobilebeat Conference available here). As pointed out in a previous note, Google is making significant investments to enable development of web-based apps that reside in the cloud. The wisdom and relative merits of browser-based vs. native apps are hotly debated, with strong opinions on both sides of the argument.

Critics point out that the cloud model in mobile is handicapped by two factors: (i) users must be continually connected to the network to use web-based apps, and (ii) users' experience varies widely with network speed and the quality of connection. In the previous note, we noted the importance of Google Gears, developed to address both of these issues. Gears enables web apps to run even when the user is not connected to the Internet. In addition, as reviewers have pointed out, Google Gears significantly increases the speed with which web-based apps load and run. Michael Arrington described the benefits after MySpace implemented Gears:

> "Instead of scrolling through pages and pages of messages, users can now sort by date, from, status (read/unread) or subject. And, more importantly, users can also search the full text of messages. The results are shown instantly (think Outlook), without page refreshes." (May 2008)

Google Gears, then, combines the best of cloud computing with native apps that run

on devices. By using caching and other tricks, Gears also reduces the latency of web-based apps. Given the impact of latency, the importance of Gear-like functionality to the success of web-based apps can't be overstated. We believe Gears will prove to be a critical component in Google's mobile toolkit, possibly more important than its Android OS.

We should also note that web-based apps, by performing the "heavy lifting" in the cloud, make sophisticated apps available to users with lower-end — and therefore less expensive — mobile devices, not just smart phones with faster processors and abundant memory. With low-cost devices, web-based apps, coupled with lower-cost connectivity, could unleash demand for mobile data even in emerging mobile markets.

Lastly, and this is purely speculation, with its vast network of servers and location-awareness, Google could be in a unique position to host and speed access to mobile data, much like Akamai and other Content Delivery Networks (CDN), further reducing latency.

Teaching the World to Speak English

In his presentation at TED this past February, Jay Walker, the founder of Priceline, indicated that more than 2 billion people around the world are trying to learn to speak English. He noted that in China, by law, students must begin to learn English in the third grade. Walker also showed an image of adults, gathered in a massive hall in China, learning English by shouting it at one another.

So what does this have to do with Google? Google has introduced two services that make use of speech recognition technologies. GOOG-411 is a combination Directory Assistance/Yellow Pages that allows users to call and request listings for local businesses, either specifically by name or category. Last fall, Google added voice search to its app for the iPhone — voice search allows users to submit web search queries by speaking rather than keying in their request.

Linking the rapidly growing volume of queries to these two services with actions taken

by users, Google is rapidly improving its speech recognition engine, tuning the capability to better understand variances in dialects, intonation, and other aspects of speech.

Combining these with other advances in speech recognition, Google could help realize the potential for mobile devices as learning tools — mobile devices could serve as personalized language labs, allowing users to hear, speak, and get feedback as they practice enunciating words and phrases in a new language.

In Google we trust?

Language instruction for the masses is an example of a mobile market opportunity requiring assets, capabilities, and aspirations that may be unique to Google:

- Cloud computing, necessary for the processing power required for advanced speech applications (see also, "How Speech Technologies Will Transform Mobile Use")
- Capacity to store and process massive quantities of data in real-time, with near-zero latency
- Ability to leverage learning from the equivalent of clickstream data — in this case, voicestream data, if you will
- Resources to invest in and create services for markets that could take some time to develop, much less become profitable
- And last but not least, experience monetizing new services using innovative business models, including subsidizing prices on already low-cost devices

Despite these competitive advantages, Google is pursuing an ambitious agenda in a business outside its core and there is no guarantee that it will be successful. Moreover, there are several issues that could slow or even derail Google's efforts in mobile:

- While one of the principles articulated by Google's founders is "Don't be evil," policymakers, consumer advocates, and users are concerned about the power

Google wields as it collects and uses search data. As it ventures further into mobile and cloud computing, these concerns will only intensify.

- Noting inconsistent results in its past performance, critics cast doubt on Google's ability to bring innovative new products and services to market
- Finally, there are some who question whether Google's core business model — monetizing page views with ads — can be extended or adapted to other markets, including mobile.

Time will tell, but it is apparent that Google believes mobile is the next big thing, and is intent on capitalizing on opportunities in mobile much as it did in the early stages of the Internet. One last point that lends support to our belief — if successful, Google is likely to expand and accelerate mobile usage, which could "raise the tide" not just for Google, but for others who stand to benefit as well, including advertisers, end-users, and potentially even operators. Strategies that yield a win-win-win for consumers and others in the value chain have a very good chance of succeeding.

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