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Web Usage and Mobiles - Some Details and Trends from 2008

Charles McCathieNevile

This note takes a brief look at trends in the usage of Web from mobile devices, specifically studying data regarding Opera Mini. It looks for unexpected results, and for differences that appear regionally, identifies some trends and some areas for further study of mobile Web usage.

Keywords: Mobile Sites, Mobile Web, Opera Mini, Transcoding, Web.

1 State of the Mobile Web

1.1 Introduction

For all of this decade there has been talk about the Mobile Web as “the next big thing”. In the late 1990s it was often felt that the only way to use a mobile would be through specially designed gateways, accessing specially-designed Websites. This led, among other things, to huge investments in WAP technology [1] by a broad consortium of companies[2], and in parallel to the development of cHTML [3] and the iMode service pioneered by Japan’s NTT DoCoMo. Some early transcoding systems provided access to general Websites by converting them to WML, but most investment was focused on developing so-called “walled gardens” (WML-based portals and sites typically provided by operators, who controlled the links that could be followed and in some cases restricted browsers to push users to their own portal). Over the last decade improvements in handsets and in bandwidth have resulted in an evolution from the early days of simple WAP and iMode content and browsers. During this time the “WML” language has been evolved to the point where its current version, XHTML-MP 1.2 [4] is the same as W3C’s XHTML 1.1 Basic [5], and in practice most browsers in mobile phones

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now accept something approximating the “tag-soup” content expected on the “standard” Web [6] rather than properly handling XHTML of any sort.

Opera was probably the first to put a standard “full Web”¹ browser on a mobile phone, some 6 years ago, using the mobile browser they had developed for palmtop devices which first shipped in 1998. Since then “full Web” mobile browsers have evolved into modern AJAX-capable browsers such as Opera Mobile for s60 (2005), followed by Nokia’s browser, Apple’s iPhones, and Opera’s browsers for high-end Windows Mobile devices such as HTC’s Touch Diamond, Samsung’s Omnia and SonyEricsson’s Xperia.

While hundreds of millions of devices have now been sold with both WAP and “full Web” browsers, users have generally been slower to make use of the Web-browsing capabilities of their telephone. The last three years have seen

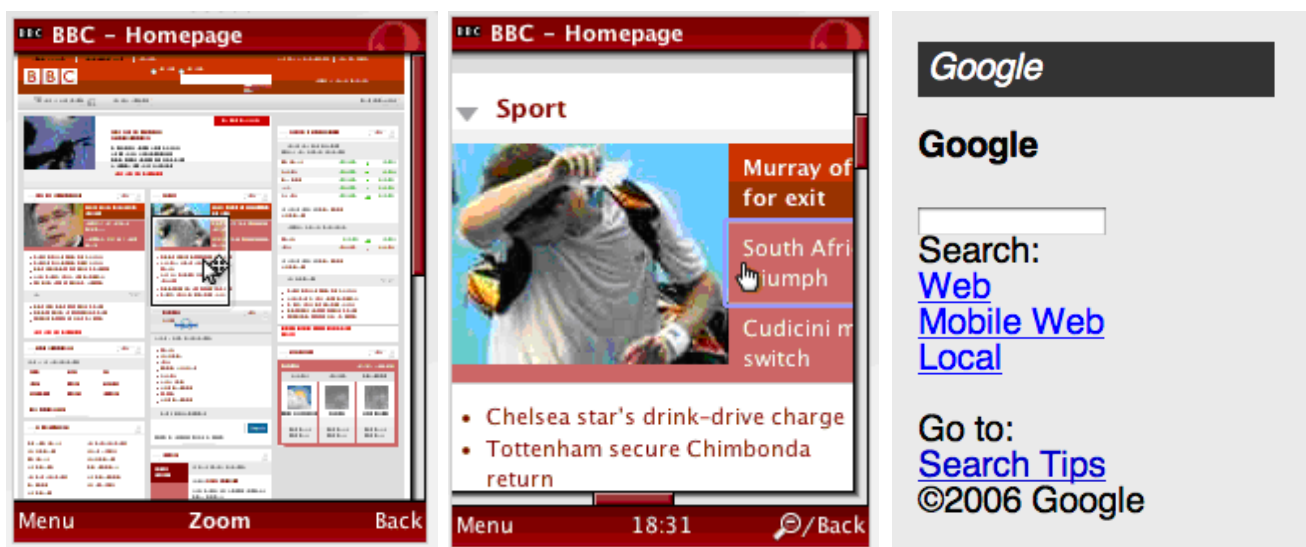


Figure 1: The BBC Website in Opera Mini (Overview and Zoomed), and Google’s 2006 WML Page.

this situation change, with mobile browsers beginning to show up as serious players in the general Web market [7].

This study analyses some data from Opera Mini, one of the most popular mobile browsers today, to determine whether there are significant differences between what people do when browsing from a Mobile and from a desktop environment. Although one expects some difference between Opera Mini usage and usage of other mobile devices, the data available is an interesting set to study. Whether common trends hold across different devices is left for further investigation.

1.2 Methodology

Opera Software has, since April 2008, published a monthly report entitled “State of the Mobile Web” [8]. This report is actually derived from the usage of Opera Mini, one of the fastest-growing mobile Web browsers, with around 20 million unique monthly users at the end of 2008 (compared to 50 thousand in January 2006, the month it was launched). Opera Mini works by providing a transcoding proxy, which allows a very thin client (around 100 KB as a Java midlet²) to render Web pages on even relatively low-powered devices. Although it does not have full AJAX support it manages to provide a meaningful user experience for a very large proportion of Web pages. The proxy collects some basic statistical data (more detailed information is available from the Opera Mini Privacy Policy³) which is used to generate the report.

This is not, of course, an entirely representative sample. Opera Mini is particularly designed for “feature phones”, which is to say mid (to low) capacity devices rather than the high-end handsets such as the HTC Touch Diamond, Sony Ericsson Xperia, or the Samsung Omnia which all run Opera Mobile, the AJAX-capable high-end modern browser, or analogous top-of-the-line telephones such as Nokia’s N95 with Nokia’s S60 Browser or Apple iPhones running mobile versions of Safari.

Opera Mini has been available on a trial basis in some countries since late 2005, with general release from the beginning of 2006, and the author has been able to look at some slightly more detailed usage data provided by Opera software. While it is not possible to release all that data in connection with the current paper, it appears to broadly mirror the data provided in the State of the Mobile Web report.

1.3 High-Level Trends

Looking at the reports together, there are some clear trends. Most obviously, the top countries have been relatively stable. Since the first State of the Mobile Web report Russia has always been the number one country in terms of end-user numbers. Indonesia has always been number two country for the number of unique users. Indeed, in eight months only eleven countries have been in the top ten for user numbers, with Egypt displacing Germany for a while in late 2008. However there has been movement, with places 3 to 11 changing around.

Similarly to user numbers, overall page views and data consumed have seen a basically steady increase. One interesting result is that page views per user have increased, meaning users apparently make more use of Opera Mini as time goes by. With growth in users of around 300% year on year, this means that we should expect to see some maturing of usage patterns.

2 Popular Types of Site

2.1 Social Networking

Overwhelmingly, searching for data and social networking are the two most popular uses of Opera Mini. Vkontakte.ru, a Russian-language social networking site, is generally the single most popular website, with other social networking sites such as Facebook, Friendster, Yahoo, Orkut, and My.Opera showing up high in the list (with

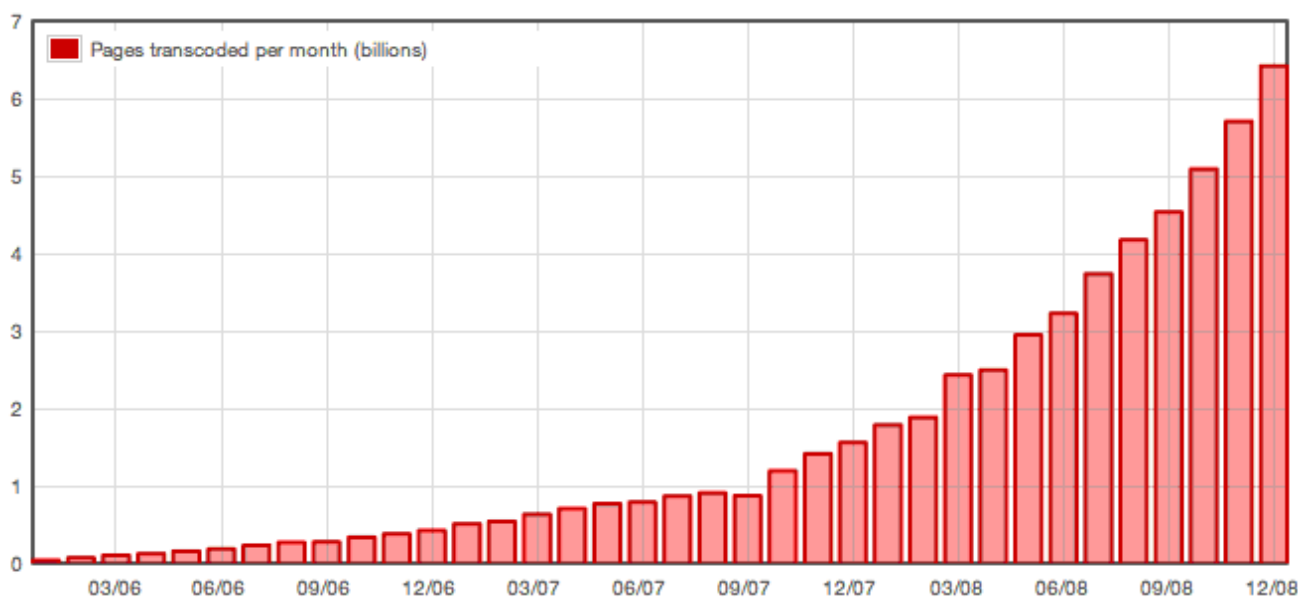


Figure 2: Page Views per Month in Opera Mini [9].

some variation according to the country, it appears that many countries have one or a few favourite sites, and these were given further treatment in the December report [10]).

2.2 Search Engines

Search engines such as Google, Yahoo, Yandex and Baidu are also consistently in the top sites. Generally these are the “full web” version rather than a mobile-specific site, although some sites automatically adapt their output based on determining the client. However, the search results are for the Web as a whole rather than the mobile Web. When the Yahoo! search was the default in Opera Mini, it provided results for “full Web” and “mobile Web”, i.e. sites which it identified as being specifically adapted to mobile devices. Unfortunately data on which results were more popular is not available, but it would be an interesting area of study.

2.3 Mobile-Specific Sites, or not?

One result that may be surprising is the use of mobile-oriented sites compared to sites which are simply designed for the general Web. This is far more difficult to study in detail, because there are various ways of providing mobile-specific content to a given device. However it is clear that there are many sites users are looking at which are not mobile-oriented.

Some sites which have heavy use of AJAX, multimedia, and other technologies not easily offered on a simple phone show a marked preference for the mobile version. Facebook and YouTube fall into this category. This information is not necessarily apparent from the “State of the Mobile Web” reports, which aggregate different sites together for such services, but can be seen in the more detailed statistics studied by the author. This is done in part because some sites will determine the browser being used and dynamically adjust the content served, so dividing the counting according to whether a “mobile-specific” domain was accessed would not result in more accurate statistics.

However, there are a number of sites in the dataset available to the author which show a preference for the “full” version of the site, even when there is a mobile version available. It appears that where possible, users prefer the functionality that is familiar from the desktop, rather than simply opting for mobile versions by default.

Another category of “mobile sites” are those which offer products or services specifically designed for mobile phones. There are some of these in some top tens, offering games for mobile phones and the like.

Interestingly sites using the .mobi top-level domain only very rarely occur in the top-tens, with markers like “wap” in the domain name being far more common, although some such sites simply use a domain name that does not specifically identify the site as mobile-oriented. In the first report, sites identified as mobile-oriented were responsible overall for about a quarter of the data transferred, but no repeated analysis of this figure is available and it is not entirely clear how the number was determined.

2.4 Adult Content

Yes, there is adult content available on the Web. Possibly a lot of it, although this study does not make any attempt to measure it. Perhaps surprisingly, it is also popular on mobile phone browsers. It is rare for adult content to reach the top ten sites which would be listed in the report, but Opera’s policy is to actually remove them from the report if that should happen.

Less surprisingly, dating or matchmaking sites are also popular, more so in general (i.e. overall and in breakdowns of countries, to the point that they occasionally show up in the top 10 lists) than sites which simply offer erotic content. This is in line with the general popularity of social networking services. Given that some of these sites are poorly adapted for mobile browsers, instead designed specifically for desktop rendering, this reinforces the notion that the content is of overwhelming importance to users in choosing what type of site to view from a mobile.

2.5 Diversity and Consistency

As well as the trends mentioned above which hold across the various countries, there are some things which are more localised. While the interesting data has been published already in the State of the Mobile Web reports, it has not all been highlighted in those reports.

2.5.1 Local Communities

In general we see that the most popular sites are large, multinationals brands like Facebook and Friendster, Yahoo and Yandex. Some mail and messaging services are also very popular in a few countries, and news and sports are themes common to a number of countries. These services are also generally dominated by a few big names. For example BBC is particularly popular in many countries, both English- and Arabic-speaking.

However in a few cases we see local sites that are exceptionally popular. In countries such as Slovakia [11], Poland [12], Russia [13] or China [14] there are a majority of country-specific domains even in the top ten. Overwhelmingly it appears that countries which prefer local content are primarily former “Communist Bloc” countries in Europe, or countries which are still run by Communist Parties such as Vietnam and China. This study is too superficial to draw any particular conclusions from that data, but it appears to be an interesting avenue for further investigation.

¹ I use the terms “full Web” and “mobile Web” to distinguish “everyday” Websites which were designed without particularly considering that users may be accessing the site from a mobile device from the subset of such sites which are specifically oriented to users of mobile phones.

² A MIDlet is a Java application framework for the Mobile Information Device Profile (MIDP) that is typically implemented on a Java-enabled cell phone or other embedded device or emulator. MIDlets are applications, such as games. <<http://en.wikipedia.org/wiki/MIDlet>>.

³ <<http://www.opera.com/privacy/#operamini>>.

2.5.2 E-Commerce

In general well-known sales sites like Amazon and eBay do not typically make the top 10 (although they appear in the deeper data made available to this author). The major exception is in Germany, where eBay has consistently appeared in the top ten list, generally at around number 5.

However there are a couple of sites of other sites which have made a local impact. In October's "Focus on South East Asia", the figures show [15] that in Brunei Dar-es-salaam the site Bruneiclassified.com appears as number five, and from time to time the Indian Railways Website, www.indianrail.gov.in, appears in India's top 10 [16] (globally it is a top 500 site for Opera Mini users). Even more locally, capetown.gumtree.co.za, a site devoted to items for sale in and around one city in South Africa, has appeared several times [17] in the top ten sites for that country. Again, this study leaves the reasons for these anomalies (or why people are generally more interested in sports results than stock prices) as a topic for further investigation.

of the traffic, and in Indonesia Friendster alone accounted for over 50% of traffic (meaning that the other 99 sites in the top 100 accounted for less than one quarter), this suggests that the long tail is very long. Taking the figures, four out of every five users (on average) have chosen to look at a site that no other user had seen yet in that month. So the variety of sites used is similar in range to the variety of users themselves. It should be noted, however, that there appears to be some regional variation in the popularity of the most popular sites, i.e. in the precise distribution of the "long tail" curve from country to country.

3 (Un)Common Clients

It is clear that Opera Mini users are broadly reflective of the telephone market. We see popular phones appearing as the most popular devices in various regions, with Nokia globally prominent, Chinese brands being more popular in certain markets, Blackberry being popular in the US, and so on. These results match simple expectations, but there

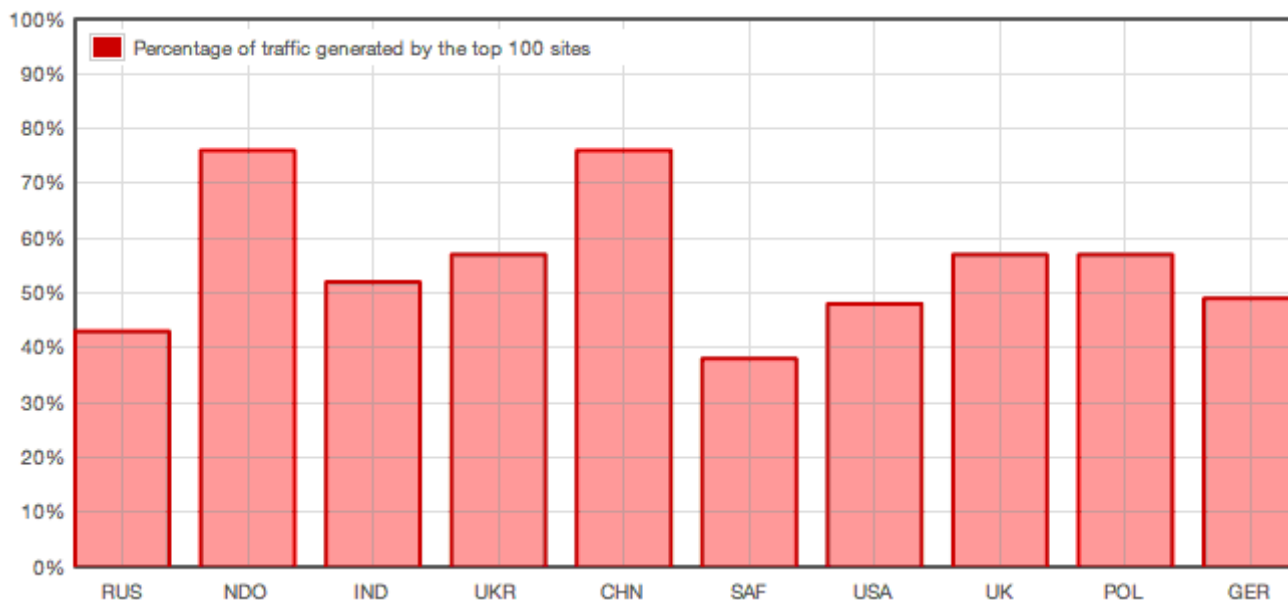


Figure 3: The "Long Tail", Proportion of Page Views Generated by the Top 100 Sites, for each of the Top 10 Countries [18].

2.5.3 The "Long Tail"⁴

While there are a few dozen sites that reappear in the top ten list for many countries, an important question for developers is whether their site will be used by people with a mobile browser, and how. Almost a priori, most sites are not the most popular, so the question for developers is how diverse the range of sites used is overall.

A Long Tail snapshot [18] from the August report shows that in the top 10 countries there are only two where the top 100 Websites make up more than 60% of the page views. In Russia, with the most Opera Mini users, the top 100 Websites only make up 44% of the traffic. But then Indonesia, the number two country, is one of those where the top sites control a large amount (76%, the same proportion as China).

Globally in that month, about 15 million people viewed about 12 million sites. While only 87 sites consumed more than half

are a couple of curious anomalies.

In the September report, there was a highlight on Africa. Many of the results are unsurprising: like the rest of the world, search and social networking dominate, with news and entertainment (primarily BBC in English and Arabic speaking countries, with the sporting newspaper L'Equipe outranking Le Monde in more French-speaking Côte d'Ivoire). Large economies like South Africa, Egypt and Nigeria are the leading countries in terms of overall users, with Libya and others showing enormous growth (several thousand percent, com-

⁴ Term first coined by Chris Anderson in an October 2004 Wired magazine article to describe the niche strategy of businesses, such as Amazon.com or Netflix, that sell a large number of unique items, each in relatively small quantities. <http://en.wikipedia.org/wiki/The_Long_Tail>.

pared to hundreds for the top countries).

The devices used in the high-ranking countries reflect relatively modern economies with modern handsets, and as for the rest of the world in many cases these include devices which have a reasonably advanced, AJAX-capable, modern Web browser. But there is an odd anomaly in the figures for Zambia [19] and Swaziland [20]. The devices for those countries are generally as we might expect, but among them (at number 3 in Zambia and number 4 in Swaziland) is “desktop”. People in these countries are apparently using the demonstration applet (made available to test mini) as a primary browser. These are countries where page views are outstripping user growth by a factor of around 3, so it appears at first glance that this is not simply a lot of people testing on one platform before using.

In fact this applet simply needs to be run in a Java Micro Edition environment. While the demonstration that has been available for a couple of years [21] is designed explicitly to be run from within a browser, since at least the beginning of 2008 [22] people have been publishing instructions on how to install the applet and run it directly from a desktop computer. It is not terribly complicated in practice, and it appears that there have been repeated independent instances of people describing the process and offering ad-

vice. The motivations for using Opera Mini [23] in preference to a desktop browser are generally to save bandwidth, often for people using dial-up connections or people using their mobile phone as a modem.

Questions that people have asked in fora following up this usage shows that people are using it across a wide variety of circumstances, with explanations being published across the globe (from Madagascar to Russia). With the recent proliferation of “netbooks” (cheap devices much smaller than a standard laptop but larger than even the high-end telephones available, and often with fairly low power for a notebook) one might expect this usage to become more common, especially in countries where bandwidth is still charged as a consumable rather than at a fixed price.

4 Bookmarks?

Finally, Opera Mini allows for bookmarks to be pushed to the device. This would appear to be a successful method of generating traffic. While Opera’s own social networking site My.Opera.com was generally ranked around 700 by Alexa.com over the last half of 2008, for Opera Mini users it generally ranked in the top 100, and in many countries appeared in the top ten Websites. It might be that Opera Mini users are more likely to use Opera products in general (with



Figure 4: The BBC Website. Screenshot of Opera Mini Running on a Full-Size Desktop Computer.

Opera link designed specifically to support moving data between different versions of Opera for a single user, this is certainly a goal of Opera's, but it would appear from data supplied to the author that part of this effect is more likely due to its presence as one of the default bookmarks on the Opera Mini front page. However, more detailed research is needed to better establish this, and to determine to what extent it holds for other sites which have this front-page presence.

5 Desktop Trends

Alexa [24] is a common reference for the most popular Websites in general, and while non-desktop usage is growing rapidly it is still safe to assume that overall traffic represents desktop viewing to a very large degree.

Clearly, search and social networking are also the key applications overall. Similar sites rank in the top tens, although there are some notable differences. For example, as noted above, My.Opera is far more popular with Opera Mini users than it is overall. There are also some mobile-specific sites which rank notably higher on Opera Mini than overall (gamejump.com in the US and wapos.ru in Russia are examples of this genre), and news sites generally rank as high or higher on Opera Mini as they do in the Web at large.

On the other hand, as noted previously eCommerce sites are generally not as popular among Opera Mini users as they are globally, and where they are, highly local sites are likely to be more popular than general ones. Table 1 states that eBay is more popular overall in the US than Craigslist, but the data made available for this paper shows that Craigslist is far more popular than eBay amongst US-based Opera Mini users, with Craigslist sub-domains for a couple of large cit-

ies each getting almost as much traffic as eBay.

A couple of other differences are notable with further data. Pure photo-sharing sites are far less popular among Opera Mini users than in general, an effect that is much more pronounced overall than the relative popularity of video-sharing sites. Similarly, sites which are primarily oriented towards blogging and content creation are less popular among Opera Mini users, although sites like WikiPedia do not show this effect.

6 Conclusions

Although there are some differences between the use of mobile phones and desktops to access the Web, it seems that Opera Mini users are doing many similar things on the phone to those that they are doing on a desktop computer, especially as it relates to personal entertainment and keeping in touch. There seems to be less clear business usage, however we classify it, perhaps in keeping with the conception of a mobile telephone primarily as a personal device for communication.

There is clearly a desire on the part of many people to access the Web, for a variety of reasons, and in a variety of ways. The length of the long tail tells us that while a few "mega-sites" are immensely popular, the data from further down the popularity scale shows that in general Web developers should probably expect an increasing number of users from a broadening range of systems to be accessing their content. Whether this suggests that they should invest in specific mobile-optimisation (which sometimes is far less popular than access to the "main" site) or in a design paradigm that more readily lends itself to adaptation by the client is a question which a cursory glance such as this cannot answer, but one that it raises.

	Russia		USA	
Ranking	Opera Mini [25]	Alexa [26]	Opera Mini [27]	Alexa [28]
1	vKontakte	vKontakte	Google	Google
2	Mail.ru	Yandex	Facebook	Yahoo!
3	Yandex	Mail.ru	Friendster	MySpace
4	Odnoklassiki	Odnoklassiki	MySpace	YouTube
5	Rambler	Rambler	WikiPedia	Facebook
6	Google	Google	Gamejump (Alexa: ~200,000 for USA)	Windows Live
7	My.Opera (Alexa: ~700 for Russia)	Narod.ru	Yahoo!	MSN
8	WikiPedia (Alexa: 11 for Russia)	YouTube	My.Opera (Alexa: ~1300 for USA)	eBay
9	Wapos (Alexa: ~20,000 for Russia)	LiveJournal	YouTube	WikiPedia
10	Seclub (Alexa: ~7000 for Russia)	Ucoz	NYTimes (Alexa: 25 for USA)	Craigslist (Opera Mini: top 50)

Table 1: Comparison of Rankings for Russia and USA: Opera Mini and Alexa.

7 Further Study

A serious research paper would investigate the various findings from this short note in more detail. In particular, areas that seem interesting are the usage of mobile browsing in particular sectors, and the overall prevalence of sites adapted for mobile usage (and users' preferences for those, or not). The use of mobile browsers in general is a field which could benefit from research, and determining answers to a whole range of questions about the use of specific clients, of different classes of device (why do people use Opera Mini on the Nokia N95 in preference to the built-in browser? What is the growth trend for using it on Desktop devices? etc.), and so on would in fact be valuable to the Web development community. It is the intention of this note to point out some interesting avenues to follow, with the hope that they lead to useful discoveries.

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- [4] <<http://www.openmobilealliance.org/tech/DTD/xhtml-mobile12.dtd>>.
- [5] <<http://www.w3.org/TR/2008/REC-xhtml-basic-20080729>>.
- [6] <<http://simon.html5.org/articles/mobile-results>>. Although this is a very incomplete piece of research, its results can be generalised with some reliability.
- [7] Browser statistics are notoriously unreliable. But comparing <<http://www.liveinternet.ru/stat/ru/browsers.html?date=2008-12-31;period=month>> and <<http://www.liveinternet.ru/stat/ru/browsers.html?date=2007-12-31;period=month>> shows that Opera Mini usage has grown very significantly as a fraction of some overall Web usage. (Those figures are biased toward Russian content, making Opera Mini far more visible than statistics primarily collected from English language content).
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- [13] <<http://www.opera.com/smw/2008/11/#russia>>.
- [14] <<http://www.opera.com/smw/2008/11/#china>>.
- [15] <<http://www.opera.com/smw/2008/10/#brunei>>.
- [16] E.g. see <<http://www.opera.com/smw/2008/11/#india>> and <<http://www.opera.com/smw/2008/04/#india>>.
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- [23] See also <<http://my.opera.com/ariesptn/blog/show.dml/2735233>> or <<http://lawand.wordpress.com/2009/01/12/opera-mini-for-windows/>> or <<http://helpforlinux.blogspot.com/2008/12/use-opera-mini-in-ubuntu.html>> and <<http://my.opera.com/chaals/blog/2009/01/22/opera-mini-on-mac-os>> for some further instructions and discussions.
- [24] <<http://www.alexa.com>>.
- [25] <<http://www.opera.com/smw/2008/12/#russia>>.
- [26] <http://www.alexa.com/site/ds/top_sites?cc=RU&ts_mode=country&lang=none>.
- [27] <<http://www.opera.com/smw/2008/12/#US>>.
- [28] <http://www.alexa.com/site/ds/top_sites?cc=US&ts_mode=country&lang=none>.