Impact of Wikipedia.org Portal Changes

A Retrospective Statistical Analysis

Mikhail Popov (Analysis & Report)

Deborah Tankersley (Product Management)

17 August 2016

Executive Summary

For the past several months, the Portal team within Wikimedia Foundation's Discovery department has been working hard on making visual and practical improvements to the Wikipeda.org Portal page to improve user experience. These changes include a search box with article suggestions, descriptions of other Wikimedia projects, and detecting language and dynamically populating/resorting the links around the globe. Looking back at various engagement metrics, we found slightly increases but engagement with the page has stayed largely the same. Of course, engagement does not correlate with satisfaction, and we currently do not have any methods to measure Portal visitors' satisfaction and whether or not they feel welcome and end up visiting the page again or regularly.

Background

For the past several months, Discovery's Portal UX team – Deb Tankersley, Jan Drewniak, Moiz Syed (formerly), and Julien Girault (formerly) – have worked hard to make visual and practical improvements to the Wikipedia.org Portal page. The goal was to improve the experience of wikipedia.org visitors and help them get to the information they are looking for as fast as porrible. These improvements include (but are not limited to) the following major deployments:

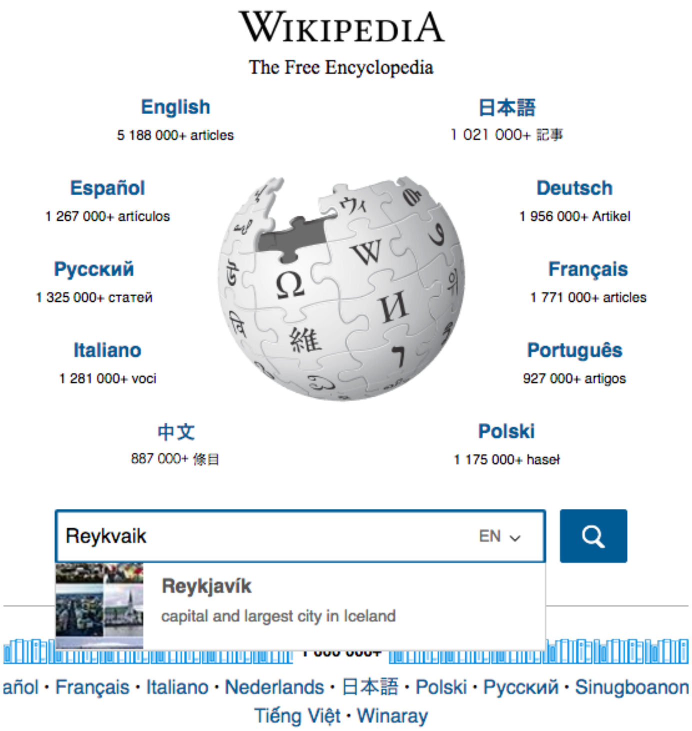
1. Search box with type-ahead and metadata (T125472 (https://phabricator.wikimedia.org/T125472)) on March 10th, 2016, which allowed us to present the user with article suggestions as they were typing their search query. The suggestions included images and metadata to help the user get to the article they are looking for.
2. Sister project links with descriptions (T133732 (https://phabricator.wikimedia.org/T133732)) on May 18th, 2016, which added descriptions to the Wikimedia projects we link to at the bottom of the page.
3. Language detection and primary link resorting (T133432 (https://phabricator.wikimedia.org/T133432)) on June 2nd, 2016, wherein we use the visitor's preferred languages settings to insert/rearrange the languages around the Wikipedia globe logo, making it easier and quicker for visitors to continue on to a Wikipedia in their language.

In Figure 1a, we see that by default the language links ("primary links") around the Wikipedia globe logo are the top 10 languages by number of articles. The first language – English – is the default language of the search box that:

1. shows the articles the user may be searching for in that particular Wikipedia,
2. shows the article image and some metadata for each suggested (English Wikipedia) result, and

3. uses the Search team's completion suggester feature to figure out the correct spelling.

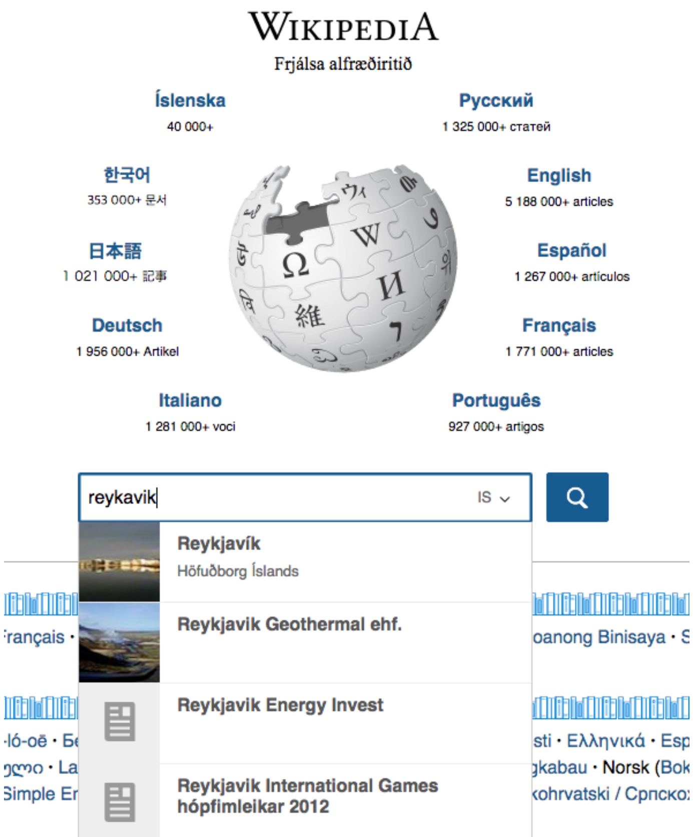
In Figure 1b, we see what visiting and searching looks like for a user who has set Icelandic as their preferred language, followed by Russian and Korean.



Reykvaik

Reykjavík
capital and largest city in Iceland

Figure 1 (a): Default experience when searching on Wikipedia.org Portal.



reykavik

Reykjavík
Höfuðborg Íslands

Reykjavik Geothermal ehf.

Reykjavik Energy Invest

Reykjavik International Games
hópfimleikar 2012

Figure 1 (b): What searching Wikipedia.org Portal looks like for someone who set their language preferences to Icelandic, Russian, and Korean in their browser.

Figure 2 shows the links to other Wikimedia Foundation projects such as Commons and Wiktionary. The links are called "sister links". As of 18 May 2016, they include descriptions of the projects. Currently, these descriptions are in English, but work is being done to translate them into the other languages so they dynamically show up in the user's preferred language like the phrase "The Free Encyclopedia" does. See T142582

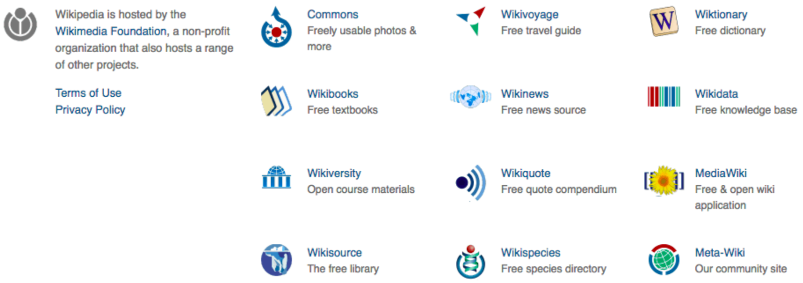

Wikipedia is hosted by the Wikimedia Foundation, a non-profit organization that also hosts a range of other projects.

Figure 2: "Sister links" to other Wikimedia projects.

(https://phabricator.wikimedia.org/T142582) for more details.

Data

We used the Siteviews tool (https://tools.wmflabs.org/siteviews) on Wikimedia Tool Labs (https://wikitech.wikimedia.org/wiki/Portal:Tool_Labs) to obtain the pageviews (https://meta.wikimedia.org/wiki/Pageviews_Analysis#Siteviews) for English, German, and French Wikipedias, which we used as the noncovariate in the Bayesian structural time series. Wikipedia.org Portal pageviews and clickthroughs were acquired from our Webrequest data (https://wikitech.wikimedia.org/wiki/Analytics/Data/Webrequest) (via this R script (https://github.com/wikimedia/wikimedia-discovery-golden/blob/master/portal/pageviews.R)) and our Event Logging (EL) data (https://wikitech.wikimedia.org/wiki/Analytics/EventLogging) (via this R script (https://github.com/wikimedia-research/Discovery-Research-Portal/blob/master/Analyses/Deployments%20Over%20Time/data_EL.R)).

Wikipedia.org Portal EL uses this schema (https://meta.wikimedia.org/wiki/Schema:WikipediaPortal) and a sampling rate of 1 in 200. Once a user visits wikipedia.org, they are randomly selected to be **anonymously tracked** with EL, we record:

- Every time they land on the page while their session is active (see below).
- Every time they click on one of the links on the page. The sections are:
    - **primary links** are the dynamically populated and resorted languages around the Wikipedia globe logo.
    - **secondary links** are links to Wikipedia in other languages.
    - **other projects** are links to other Wikimedia Foundation projects.
    - **search** is when a user interacts with the search box, which either sends them to a search engine results page or to a particular article.

Sessions last at least 15 minutes. The timer starts counting down from the user's initial visit to the page. Any clicks they perform while that timer is counting down are recorded by our EL system. If they do not visit the page again in those 15 minutes, the next time they come back to the page we do not record any of their actions and remove the old tracker. After their session expires, they have the same 1 in 200 probability of being selected again. If they do visit the page again in those 15 minutes, we renew the expiration time onthe timer. For this reason, we may have sessions that last hours and have dozens (and even hundreds!) of visits and clicks.

Exploratory Analysis

Where applicable, we used generalized additive model (GAM) spline-based smoothing to fit a smooth curve to the data to visualize overall, longer-term patterns. Specifically, we used the `s()` function in the **mgcv** R package, with a 4- and 5-dimensional basis for the smooth term (`y ~ s(x, k = 4)` & `y ~ s(x, k = 5)`) in majority of the graphs.

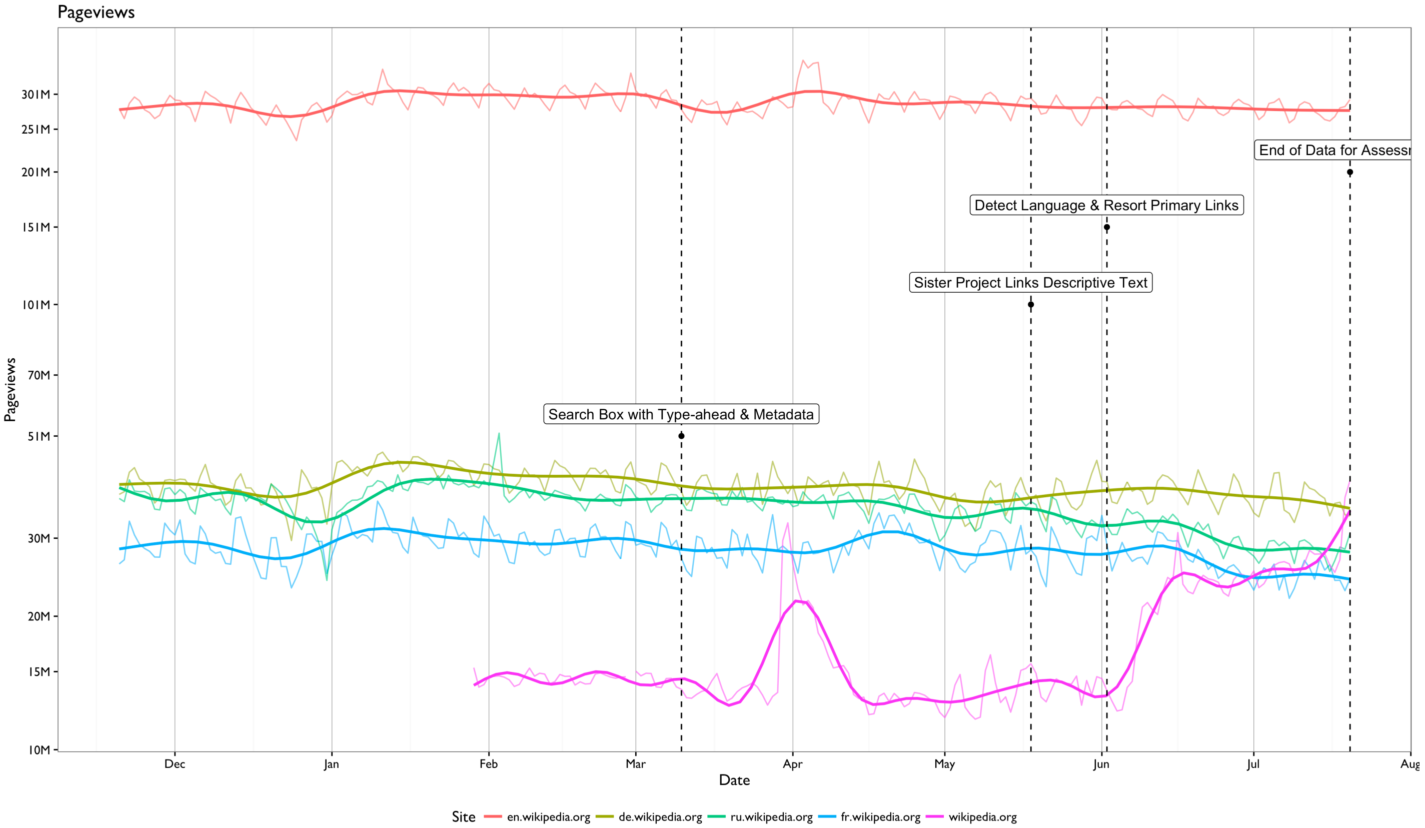


Figure 3: Pageviews over time with (`k = 20`) smoothing curves overlaid to see underlying trends. Pageviews to English, German, French, and Russian Wikipedias are provided for reference. We were too late to start looking into the April spike, as that webrequest data was purged by the time we started the analysis. The only notable thing in this figure is the rise in pageviews following the Detect Language deployment, which may or may not be caused by it along with increased publicity.

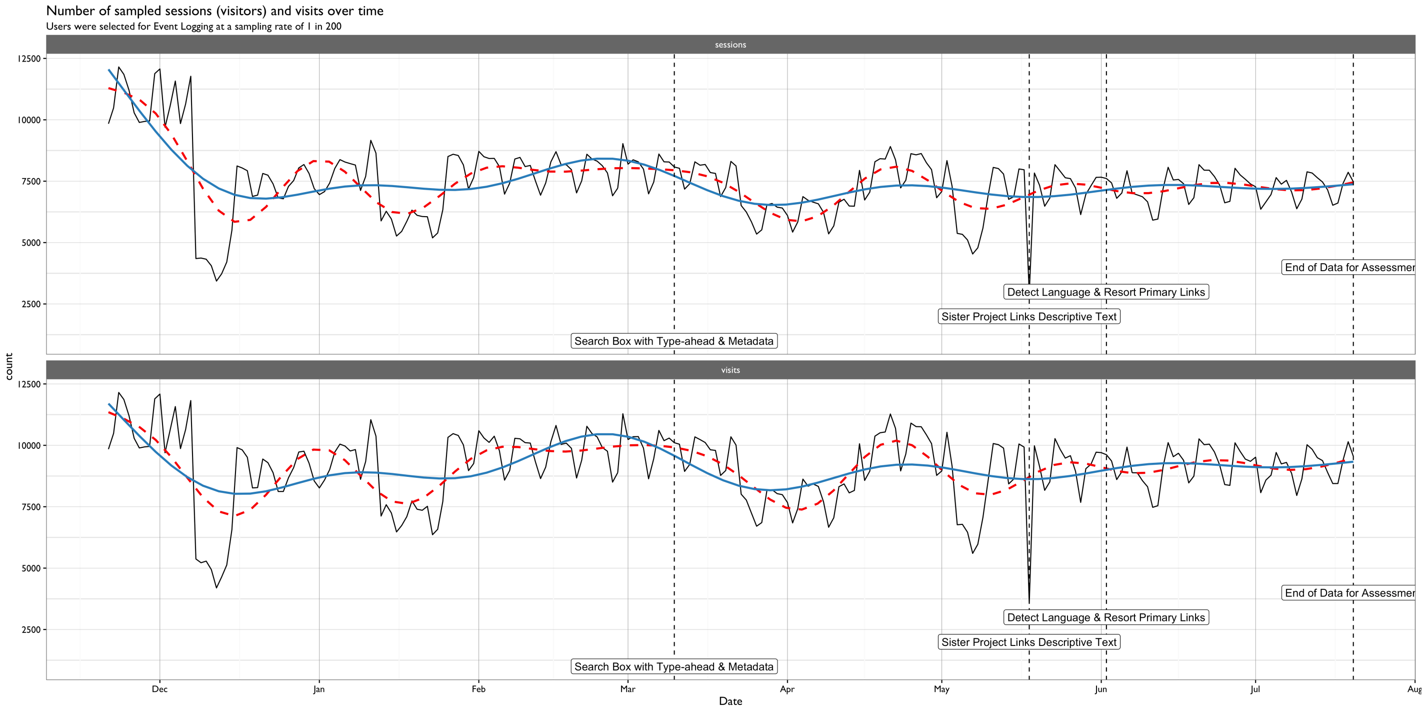


Figure 4: Number of unique sessions and visits over time (in black). The red, dashed smoothing curve (`k = 20`) is closer to the data while the solid blue curve (`k = 11`) shows a more general trend. Comparing raw counts of sessions and visits is not completely correct in this case because the way the sampling was done did not completely follow the 1 in 200 rule we initially thought it would. However, an interesting thing to note is that after the release of the language dropdown A/B test and new, more reliable "seeded" sampling method (13 May 2016), we are seeing very stable counts of sessions and visits (see T135558).

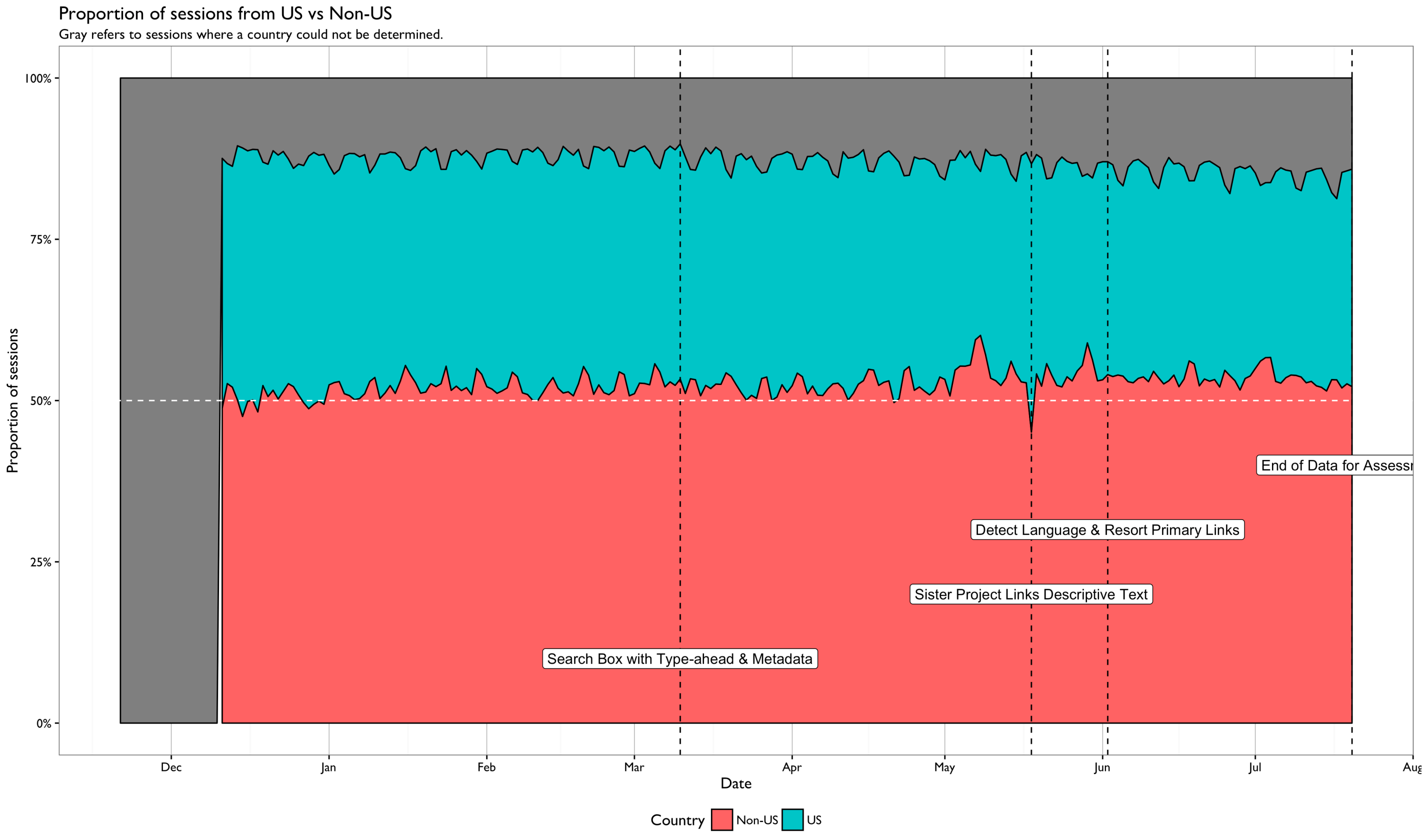


Figure 5: There is one particular aspects of this graph that is very interesting to us: the increase in the proportion of non-US sessions – almost consistently above 50% from May 2016 and onward. Perhaps our Global South efforts have helped increase knowledge of Wikipedia and its projects!

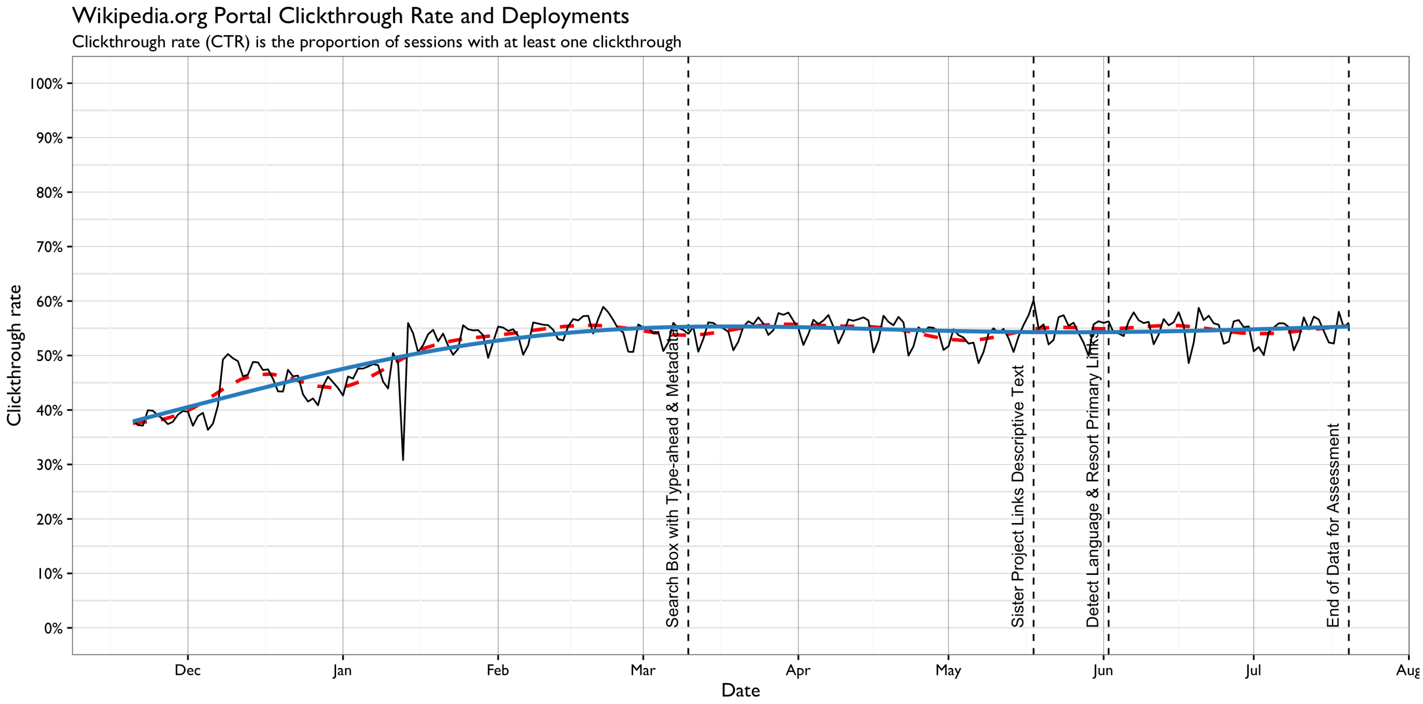


Figure 6: There are 2 GAM-smoothed curves overlayed on the clickthrough (CTR) series: a red, dashed one that more closely resembles the data and a blue one that shows us a more general trend. We can see that after the release of the search box, the proportion of sessions with at least one clickthrough has been rather stable with weekly seasonality. The deployments have not moved the general engagement up or down by a noticeable amount. We're still not sure why Saturday of all days seems to be the day where CTR is at its lowest.

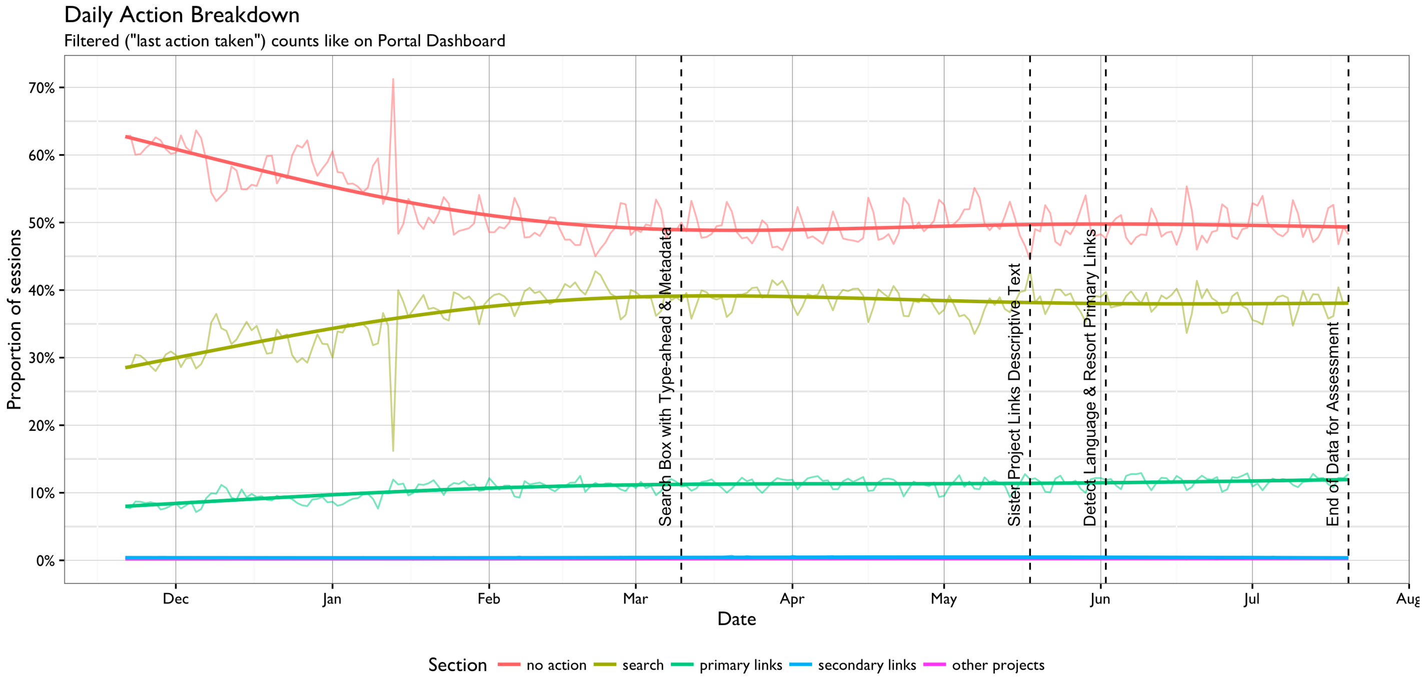


Figure 7: Likewise, when we look at "last action taken" metric – the one seen on the Portal dashboard – we see a slight increase over time in the proportion of sessions where a click on "primary links" was the last action performed. "No action"s have decreased up to the point of the search box release and then remained stable with weekly seasonality.

In Figures 8 and 9 below, we use the “most common section clicked per visit” metric. When the user goes to the Wikipedia.org Portal and gets enrolled into event logging by our random sampling mechanism, they have a tracker that stays alive for at least 15 minutes, with the expiration timer renewing every time the user visits the page within the 15 minute window. Furthermore, on each visit to the page, the visitor can click on any link as many times as they want and open as many tabs to different wikis as they want. This means that for any one page landing event (visit), we can see dozens (and even hundreds!) of clickthrough events, and that each session can consist of dozens (and even hundreds!) of visits. While the graph above uses the “last action taken” metric, the graphs below allow us to see how the most clicked section per visit varies over time.

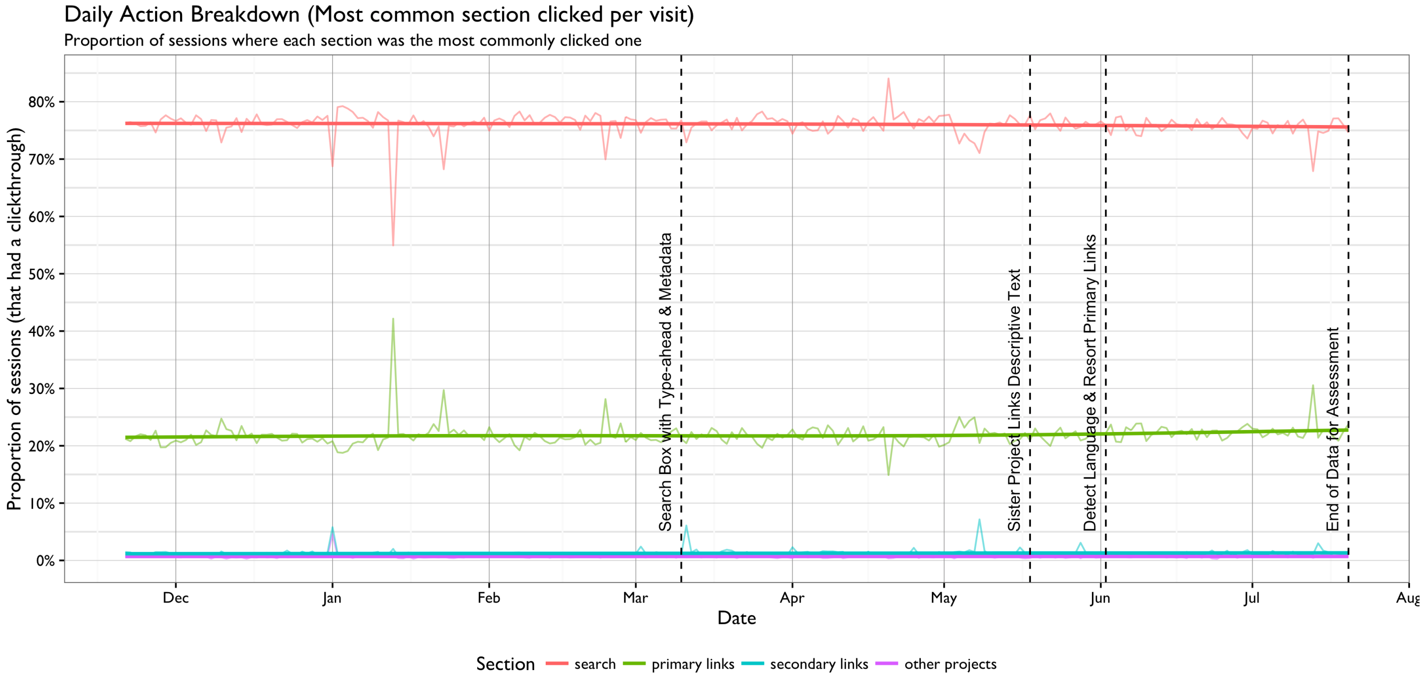


Figure 8: If we look at the “most common section clicked per visit” metric, we see that the proportions have remained largely the same, with a slight increase in primary links. That is, following the deployment of the language detection and primary link resorting, the proportion of sessions where the primary links section was the most commonly clicked section across the sessions’ visits has risen, but not by much.

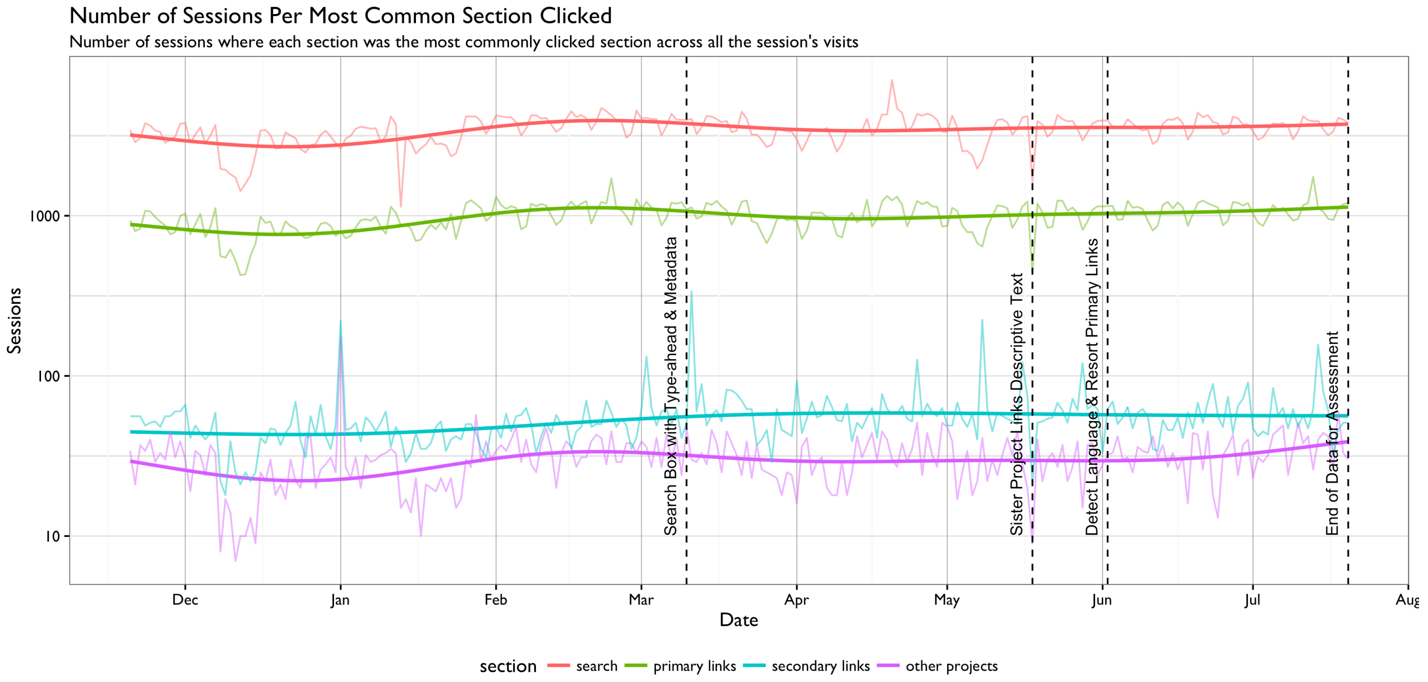
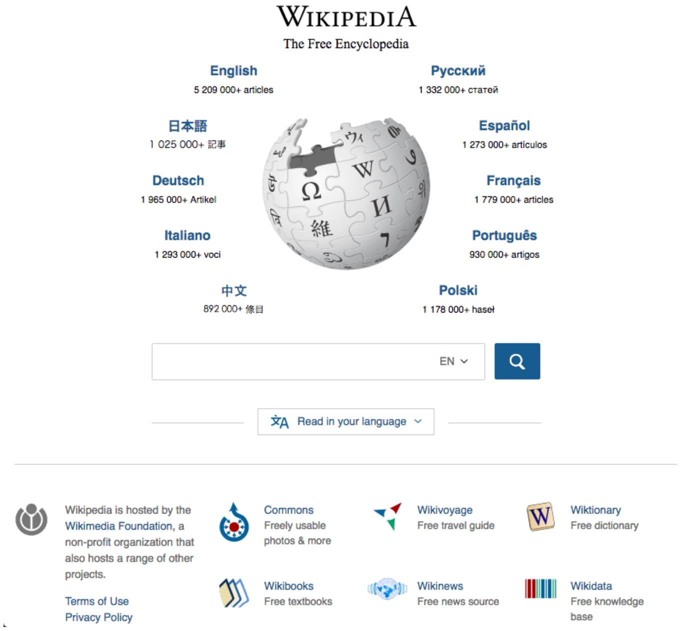


Figure 9: One noteable thing here is the increase in July in the number of sessions where the most commonly clicked section was the "other projects" section. It also appears that the number of sessions is also very slowly increasing for the other sections.

Conclusions

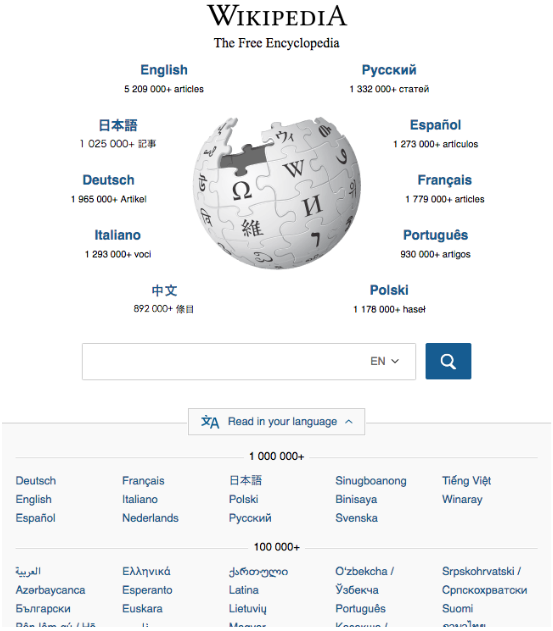
We will be honest when we say that these are not the results we were hoping for. We were expecting to see each deployment followed by a dramatic increase in an appropriate metric – mostly engagement. However, these are also not the results we feared. It appears our efforts to make the Wikipedia.org Portal page look nicer and more welcoming have not really had an effect that can be measured through these metrics. We (currently) can't measure overall satisfaction of the visitors. That is, if a person visits the page, feels more welcomed, and ends up going to the page sometime (specifically more than 15 minutes) later, we currently have no way of capturing that, and must rely on some of these engagement metrics.

On August 16th we deployed a design change that collapses the secondary links into a modal – see Figure 10 – which might or might not affect clickthroughs. In making it more modern looking and easier to see, we're hoping (unmeasurable) user satisfaction will go up even if clickthroughs (engagement) might not exactly display that satisfaction. We will monitor the Portal analytics dashboard (http://discovery.wmflabs.org/portal/) following the rollout.



Wikipedia is hosted by the Wikimedia Foundation, a non-profit organization that also hosts a range of other projects.

Figure 10 (a): Latest design change, in effect as of August 16th. Previous changes (such as language detection and primary link resorting according to user's language preferences) still apply.



1 000 000+

Deutsch	Français	日本語	Sinugboanong	Tiếng Việt
English	Italiano	Polski	Binisaya	Winaray
Español	Nederlands	Русский	Svenska	

100 000+

العربية	Ελληνικά	ქართული	O'zbekcha /	Srpskohrvatski /
Azərbaycanca	Esperanto	Latina	Ўзбекча	Српскохрватски
Български	Euskara	Lietuvių	Português	Suomi

Figure 10 (b): How the secondary links look after clicking the "Read in your language" button. The languages are organized into columns, sorted in an alphabetical order to make specific languages easier to find.