Research and Analysis of the Genode Homepage Template as Utilized by the Malawi GeoNode, MASDAP

April 4, 2017

SUMMARY

An analysis was conducted on the usability of the new Malawi Geonode website template. Invited participants were recorded interacting with the sight, and their feedback on the usability solicited. From the research, several opportunities for improvement were identified, including:

1. The ontology of information on the site
2. The filter function on the search page
3. The “icon area”
4. The “about” and “get started” links
5. The shopping cart

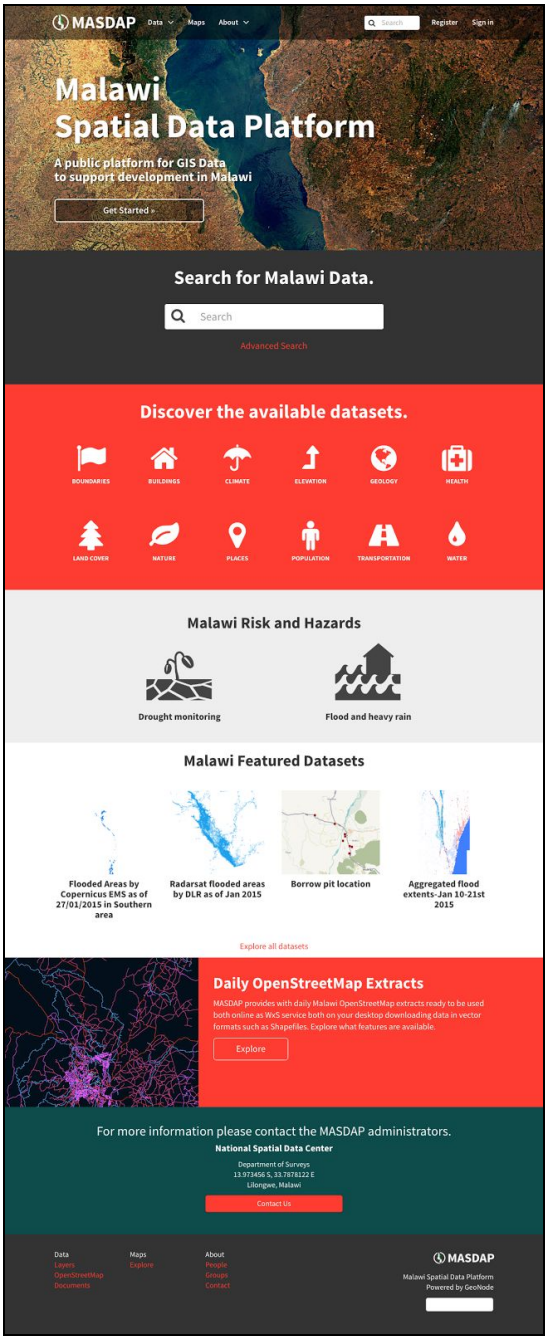
The new homepage template provides many improvements over the old template, including featured stories, icons, contact us sections improve accessibility. Site-wide navigation and existing feature flaws impacted navigability and user feelings of success or failure. The new template transposes novice needs with expert needs, placing expert-level support in the “Get Started” button that calls novices to action. The new template also attempts to surface the type of datasets available within the site to aid comprehension and use (through exploration icons and data stories). There are opportunities to improve these features.

- **Better support user types by following common conventions for accurately linking and naming appropriate content.** For example, providing site details under “About” and a simple step by step guide for “Get Started”; then linking the two pages.
- **Simplify the exploration icons in the “icon area,” they are currently too complicated and their ontology is not clear.** For example, reduce the number of icons, or sub-categorize and nest them; remove hover text and place it on a dedicated category page that is linked from the icon. This suggests the need for a new view within search that shows and explains dataset relationships. It is also recommended that the exploration icons be retitled as “suggested searches,” to match the function of the icons. The “data stories” section works well.
- Use common conventions to resolve issues with Applied Filters and the Cart.

BACKGROUND

The Malawi Geonode website is a repository of GIS data collections. The purpose is to provide access to the data by participants of different levels of expertise. The structure is basically that of an online shopping platform, with datasets that can be search for, collected in a cart, and downloaded. In addition, the homepage provides easy access to the collection for novice participants by presenting interesting datasets in an exploratory format.

Malawi Homepage (new template)



Navigation bar/header

Splash image

Featured search bar

Exploration icons, “icon area”

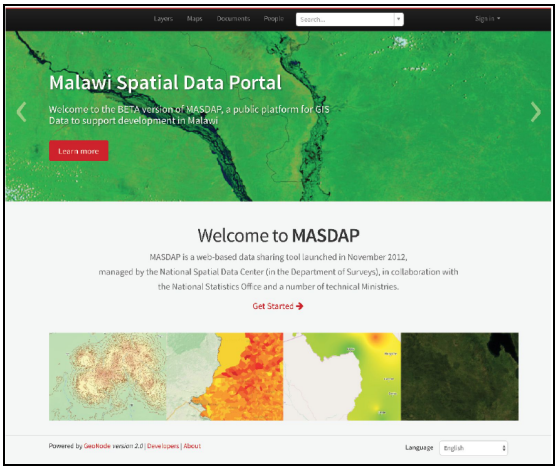
Data stories or special sections

Contact information

Footer

The homepage of the website consists of a header, a splash image, a featured search bar, an icon area, featured data stories, contact details, and a footer with contact information.

Old Malawi Homepage (Existing template)



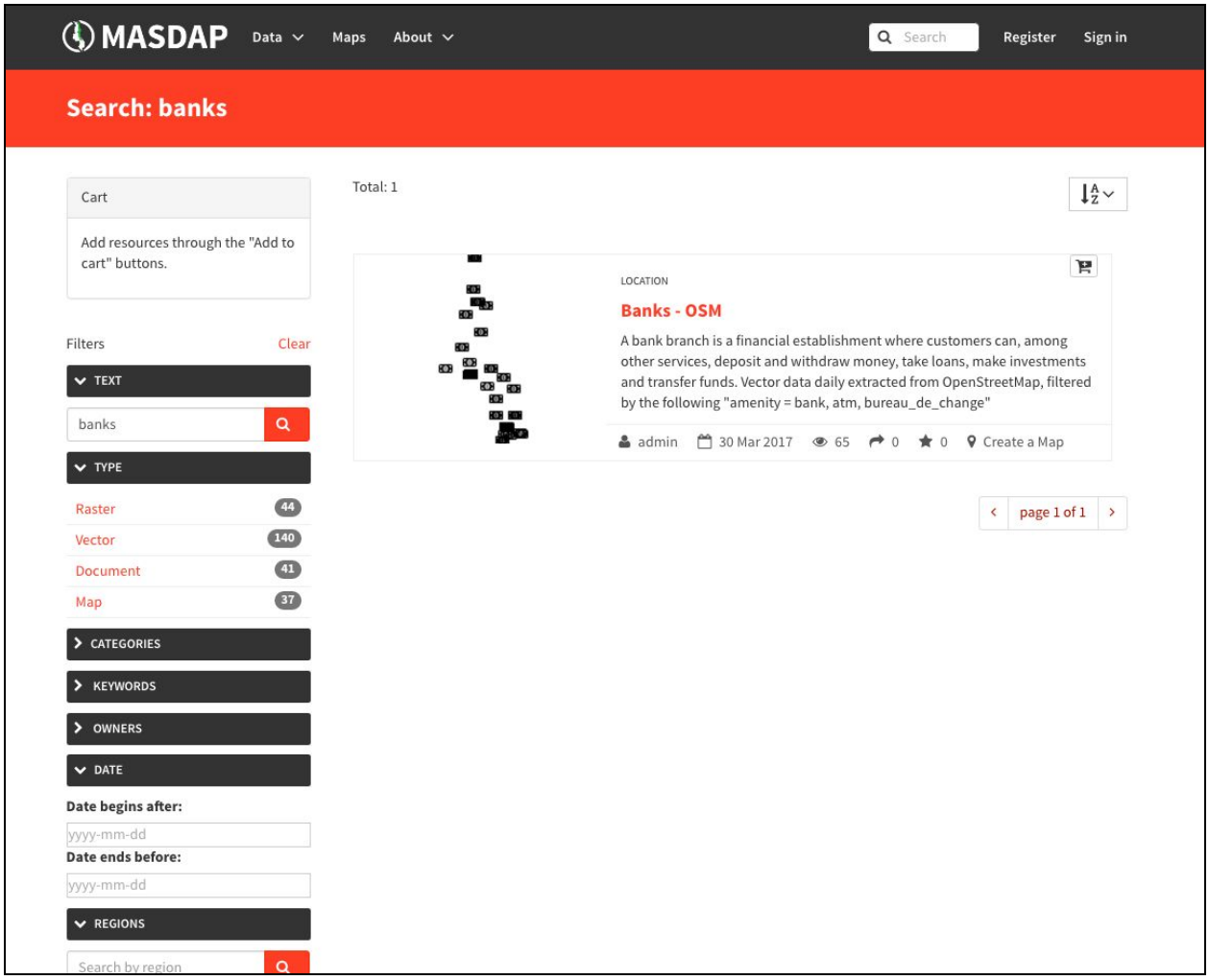
Navigation bar/header

Splash image

Data stories or special sections

Footer

Malawi Search Page



The search page contains a filter sidebar, the filtered results (datasets), and a “shopping cart.”

FINDINGS

Of the 56 people who received the invitation to test the new template, 14 accepted and entered the test site. Their interactions were recorded, and the data aggregated. Of these 14 recordings, five contributed useful information on all tasks. Task success and failures with the new template were comparative to findings from parallel testing on the old template. Presented here are samples of learnings from the study, and data that support our insights.

1. Ontology

> *"I expected to find Banks in 'buildings' not 'location' category." – Participant 4*

The ontology of the site does not match users' mental models for the data's ontology (subject categories that show their properties and inter-category relationships). One participant, tasked with finding a dataset of banks, clicked the buildings icon in the icon area. (This actually created a search filtered by society – see next result below). No bank dataset was in the returned list, but police stations and restaurants were. They commented *"I expected to find Banks in "buildings" not "location" category. It would be easier to have searched from the homepage I think."* This pattern of choosing a representational icon and failing to find the targeted data was seen across all users who entered through the category icons.

Recommendations:

1. Banks should be under buildings. They belong with police stations and restaurants. This identifies a search/filter issue within the logic of the site. While metadata problems are outside of the scope of this research, it is an important reminder that the design decisions based on the underlying structure of a site – and especially of a searchable dataset archive – are only as good as the robustness and accuracy of that structure. Without a strong structure the design usability will never meet the demands of the user.
2. Icons based on categories must be connected to the information architecture of the site, including metadata, tags, and content. See below for more details.

2. Filter

As is appropriate for a site of this type, an important functional element is the filter sidebar. As participants attempt to find exactly the data they need they manipulate the returned search results through various filters. A Geonode site necessarily has many types of filters.

The research identified areas where participants struggle:

- <u>The filter doesn't look like typical filter sidebar</u>

  It is not immediately identifiable as a filter; it looks instead be a navigation menu. This is exacerbated by the location of the shopping cart above the filter sidebar.

Recommendation: Use standard UI conventions to help participants more easily identify the filter sidebar.

- It does not clearly identify what filters are applied

  When filters are applied, they are often hidden in a collapsed dropdown list.

  Recommendation: All applied filters should be highlighted. One method is to have applied filters float to the top of the filter sidebar.

  Why this matters: One of the participants, when searching for flood risk, first clicked the water icon. When unable to find what he wanted, he then went on to search for "flood risk." But because the filter "inland waters" was already applied no results showed (the water icon sends the user to the search page with the filter "inland waters' applied). Without the filter applied results would show.

- Filters can't be individually canceled

  When a filter is applied it cannot be un-applied except by clearing all filters.

  Recommendation: Each filter should be cancelable individually at any time.

3. "Icon Area"

What is being called the "icon area" is the collection of icons of categories of datasets collected on the homepage. The purpose of the icon area is to help participants explore datasets when they don't have an explicit dataset goal.

The research identified that the participants do not use the icon area very much; that they struggle to effectively use the icons; and that the result of clicking an icon does not match expectations.

Upon click, the user's mental model for the resulting page is of curated content reflecting the icon's theme or category enabling exploration. However, the icons don't bring one to a new page, but brings the user to the search page, with filters activated. This action is not clearly identified in use and is confusing. If the intention is to use the icons as a "quick search" tools, then the section (on the homepage) should be labeled differently, perhaps "suggested searches." In this way participants will better know what to expect.

The icons in the icon area on mouse hover display a large block of text. This slows the user while they attempt to read it, and increases the amount of mental load a user exerts. If the icons led to a separate page, this text could be included on that page, and reduce the clutter on the homepage.

Finally, the ontology of the icons is not clear. For example, banks are listed under people.

Recommendation: To improve, use fewer icons, with clearer ontology, and describe them more clearly and concisely. Let people know just what these icons do.

4. About

When looking for general information such as about MASDAP, or for contact information, participants typically tried the navigation bar “About” link at the top of the web page (4 out of 6 attempts). This path led to failure. The navigation bar “About” link hides three sub-links (People, Groups, and Contact), none of which relate to information about MASDAP.

The footer “About” link was found, but never clicked on. The “Contact the Administrator” content directly above the link was immediately identified by the participants as the target of the task, whether it was the task to find more information about the site (it provided the only written details) or the task to contact the administrator.

Participants took longer (49 seconds) to identify the ‘Get Started’ icon as the location of MASDAP information. This indicates that defined content poorly supports a typical user need to learn more about the site and its content.

Recommendations: Provide real content that explains the site for “About”; combine “Groups” and “People” under one link; and make the contact info that is displayed at the bottom of the site’s homepage available in the About section.

> *“I was never able to answer the question of what Masdap is or why it was created. I feel the answer on the landing page is not descriptive enough and would appreciate more background.” – Participant 7*

In general participants should not be forced into a decision (or even thought, for that matter) when the data can be displayed in aggregate. Show all information when possible. Don’t force participants to make decisions unless necessary.

5. Get Started

Pressing a “get started” button is a way for participants to identify themselves as novices. Currently the “get started” button leads user to a page for developers, potentially advanced users.

Recommendations: Separate content designed for novice users from advanced users.

- The “get started” linked page should be simple and helpful, with basic iconography or a tutorial, and information on what they can find and do on the site.
- Provide an “Information for developers” page with the information for developers.

6. Shopping Cart
A shopping cart is a reasonable analog for collecting and downloading datasets, plus it is a standard convention in many websites. Typically the cart is a numbered icon in the upper right corner of the page. In the GeoNode template, the shopping cart displays above the filter sidebar on the “Search” page.

More importantly, the research found that the shopping cart is not functioning correctly. Participants on both the new and old templates claimed that the banks dataset could not be downloaded. There is no path to download the items collected from the shopping cart. The shopping cart serves no function for the user.

Recommendation: Move the shopping cart item list to the upper right side of the screen, to comply with standard convention. Follow additional cart conventions by: providing a “download all” function and a “view contents” function within the shopping cart.

> *“I managed to add them to my cart but then there was no download button.” – Participant 4*
>
> *“The dataset cannot be downloaded.” – Participant 6*

When attempting to download layer data, a list of file types is given. Some give useful info, some don’t. For example when a .pdf of the banks dataset is downloaded, it gives a sheet with red squares with no map or labels.

Recommendation: Recommend additional datasets and files to download to make the dataset useful.

INSIGHTS

Search is everything
So why not search for everything? People who come to the site with a specific goal go straight to the search bar. Embrace the seachiness of the site and let your participants in on it.

The logic of the site structure supersedes the UI
If there is an ontology, it must be a robust ontology. Same for search. Let people know that they are searching. Help people understand where they are on the site. There are minimal functions on the site, Advanced Search is the primary function and should be supported and developed based on common conventions.

Not everything is search
For the rest of the site, follow UI conventions. Users should be able to click on “About” to get information *about* the site.

METHODS

Recording
Code was added to a copies of both the new and old Malawi GeoNode sites that allowed the recording of visitor actions. For the duration of the test, every user had their interactions with the site recorded. The resulting information collected includes the duration of the visit to the site, the order of pages and time on each page. Note, creating copies of the GeoNodes resulted in clean dataset from individuals participating in the study. Non-study activities were not recorded making comparison between the old and new homepage behaviors possible.

From this raw data some aggregate analysis can be quickly computed, including:

- Heatmaps of the mouse position
- Click data showing where participants clicked
- Scroll data showing how far down the page the user scrolled

Tasks
Participants were asked to complete the following five tasks:

> 1. Find MASDAP information
> This is your first time to the Malawi website. Find out why MASDAP was created and what information is available to developers.
>
> 2. Contact Administrator
> You have a question about a dataset you want to upload. Contact the MASDAP administrator with your question.
>
> 3. Find 2015 January Flood files
> Malawi has very rainy and very dry seasons. Find and download the 2015 data set(s) showing the January flood risk.
>
> 4. Find the quantity of OSM files
> MASDAP hosts Openstreetmap datasets. How many OSM files exist on MASDAP.
>
> 5. Find Bank dataset
> You are developing a map of financial services in Malawi. Find and download a dataset showing the location of banks in the country.

Half of the participants got the tasks in this order. The other half started with Task 5 and then continued with Task 1 and so on. Some participants completed all tasks, while others only attempted their first assigned task and then stopped.

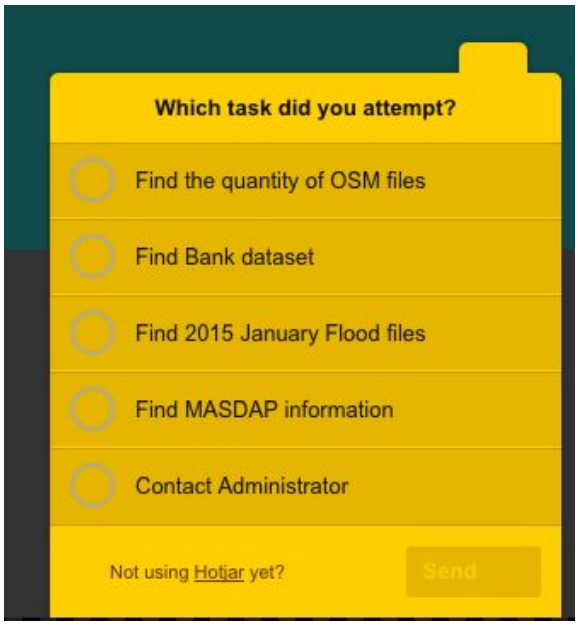
Each of the five tasks were designed to start from the homepage. Users were asked to return to the campaign email to click the task link to be taken to the website. Each time they were taken to the homepage.

Polls

In addition to the tracking and recording of site interactions, there was also a poll to collect the user's feedback on that task. After a specific duration on the site, one of two different polls will pop-up. Participants were asked to self-identify the task they attempted to accomplish, rank the ease of accomplishing their tasks (1-10, 10 = Easy) and invited to comment on the task.

Two identical polls were created and placed on both the new and old template sites. The success poll launched five seconds if a user landed on a target page indicating they have successfully completed the task. The failure poll launched after 60 seconds on a page, indicating that they had given up on the task. Data from each was compared to identify patterns.

Poll form



RESULTS

Study participants did see the whole homepage. However, they did not spend long on the new features using a fast scroll down then up when first opening the website. To complete their task looking for specific information such as floods, banks, or OSM data, participants typically directly search for the information by typing a search term in one of the two search boxes. 62% of participants started with Search. In the other attempts participants looked for the information in the icon area.

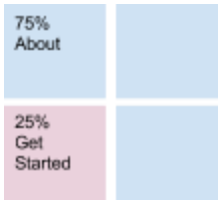
When looking for general information, such as information about MASDAP or contacting the administrator, participants typically scrolled around, or went to standard areas such as the footer or navigation bar.

Time on task was tracked, with participants on the new homepage averaging 11.8 seconds to find a target, and old homepage averaging 27.9 seconds to find a target. Participants did quickly scroll the full length of the homepage, before choosing a known path to their target: the navigation bar.

Results for each task

Task 1: Find MASDAP information

In the attempts by participants, 75% went to the navigation bar “About,” 25% went to “Get Started” in the splash image successfully completing the task. *“Found it by going straight to ‘get started’.”*



Time on Task:
New Homepage: (Target: Get Started) Average: 49 seconds
Old Homepage: (Target: About, Help) Average: 5 minutes 50 Seconds

Ease of Completing Task (10=Easy):
New: 4.5
Old: 8

> *“I was able to find information for developers relatively easily. But was never able to answer the question of what Masdap is or why it was created. I feel the answer on the landing page is not descriptive enough and would appreciate more background.”*

Task 2: Contact Administrator

In the attempts by participants, 50% went to the navigation bar “About” tab failing to complete the task. The remainder scrolled to the “Contact Administrator” feature section, successfully

finding and contacting the administrator (email received). *“Ummm... I don't think I've completed this task yet.”*—Clicked “About” > “Contact” > “About” > “Groups”, then gave up.

Time on Task:
New Homepage: (Target: Contact) Average: 1 minutes 40.8 seconds
Old Homepage: (Target: About, Help) Average: 1 minutes 26.2 seconds

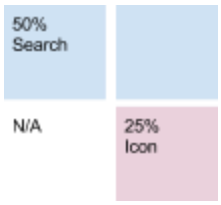
Ease of Completing Task (10=Easy):
New: 7.8*
Old: 0
*Note, while participants ranked it easy, their recordings showed they did much more searching than their ranking implies.

> *“It was easy enough, could be more easy if there is a button always in the top right hand corner of the screen so clients can always see it.”*

Task 3: Find 2015 January Flood files

> *“I entered Flood Risk as a search term and clicked on the 2015 tag but nothing came up”*

In the attempts by participants, 50% searched using the Featured Search Bar (ex. searched "flood" > "flood 2015" > 2015 = 3 data files that failed to download), 25% went to the icon area yet failed to find the datafile due to unknown applied filters. All missed the Flood data story on the homepage. *“I entered Flood Risk as a search term and clicked on the 2015 tag but nothing came up.”*



Time on Task: (Target: Aggregated flood extents-Jan 10-21st 2015)
New Homepage: Average: 2 minutes 20.1 seconds
Old Homepage: Average: 3 minutes 41.6 seconds

Ease of Completing Task (10=Easy):
New: 5.7
Old: 3.8

The low numbers for the new template relate to unknown applied filters (inland waters), and an inability to download from the cart. This data story did not exist on the old template, requiring participants to go through a data search to find the data.

Task 4: Find the quantity of OSM files

> *"There is a dedicated section for OSM in the homepage." "Just clicked on explore OSM files and the total was at the top. Pretty easy."*

In the attempts by participants, 50% searched, 50% went to the OSM data story successfully finding a new feature.

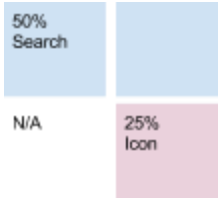
Time on Task: (Target: Search OSM)
New Homepage: Average: 1 minutes 18.5 seconds
Old Homepage: Average: 2 minutes 54.5 seconds

Ease of Completing Task (10=Easy):
New: 8
Old: 6.8

Task 5: Find Bank dataset

> *"I expected to find Banks in "buildings" not "location" category. It would be easier to have searched from the homepage I think."*

In the attempts by participants, 50% searched, 25% went to the icon area.



Time on Task:
New Homepage: (Target: OSM Banks) Average: 3 minutes 14.2 seconds
Old Homepage: (Target: OSM Banks) Average: 4 minute 19.6 seconds

Ease of Completing Task (10=Easy):
New: 6.3
Old: 7.8

Appedix

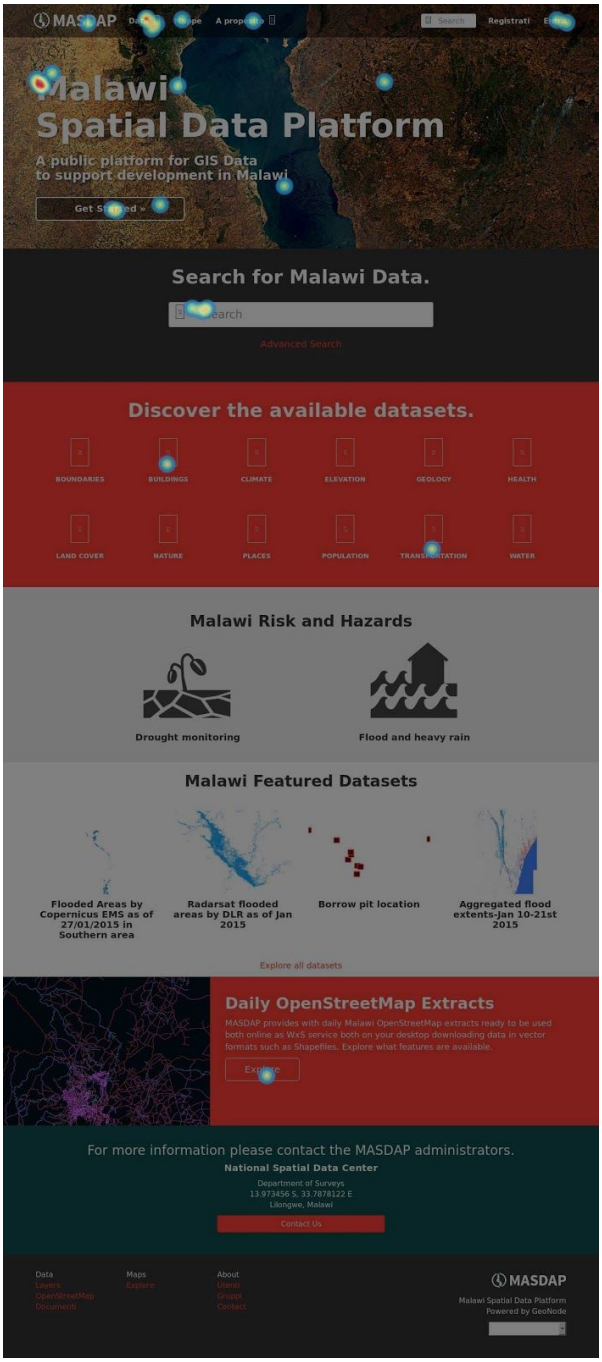
The browsers used on this study include:

- Chrome 54
- Chrome 55
- Chrome 56
- Chromium 55
- Firefox 50.0
- Firefox 51
- IE 11.0
- Safari 9.1.1

The OS System used include:

- Linux
- Mac OS X 10.11.5
- Mac OS X 10.11.6
- Mac OS X 10.12
- Ubuntu
- Windows 7
- Windows 8.1
- Windows 10

New Template User Clicks Heatmap



“Get Started” target

Search here for Bank data target

Enter here for Bank data target

Flood target option

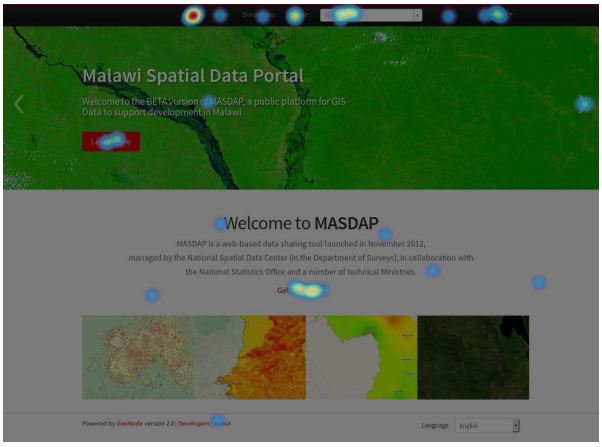
Flood target

OSM target

Contact target

Participants failed to engage with key targets on the homepage, preferring instead to search for the target.

Old Template User Click Heatmap



Multiple targets

“Learn more” target

“Get started” target

Contact target