Diet Map: participatory mapping application for specific diets

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Abstract:

Diet has become a concern that many people are aware of. We generally know about several diets: vegan, vegetarian, gluten-free, halal, and kosher. Each diet has a different key motivation. Muslims and Jews adhere to halal and kosher diets respectively, as prescribed by their religious traditions. The gluten-free diet is followed by people with celiac disease or who have several sensitivities or allergies related to wheat. Meanwhile, veganism and vegetarianism are based on several reasons related to environmental, health and animal welfare issues. However, other driving factors, such as the formation of superiority and liberation from a destructive meat production system, are also cited as motivations for adopting veganism or vegetarianism (Simons et al., 2021).

Location-based services (LBS) are software services that use geographical data to provide information or services to users. Previously available products include OpenVegeMap (https://openvegemap.netlib.re/), which uses OpenStreetMap (OSM) data to represent the vegan/vegetarian restaurants and other amenities. The idea of this Diet Map is to serve a location-based service from the users for the users, as how OSM philosophy is. We are committed to developing a user-centred design application.

Diet Map follows the OSM tag for diet (https://wiki.openstreetmap.org/wiki/Key:diet), and the amenity type (restaurant, fast food, café). The visualised diets in the application are vegan, vegetarian, gluten-free, halal, and kosher, coinciding with the most mapped diets in OSM. Apart from being an application to display amenities information, we intend to add features that encourage the users to contribute so that, in the end, incoming data can return to OpenStreetMap. Crowdsourcing or participatory mapping is very beneficial for the community from a small scale to a large scale and can improve the quality of spatial data. The previous research for crowdsourcing or participatory Geographic Information System (GIS) has introduced WheelMap as a service to visualise wheelchair-accessible places with the same principal idea as Diet Map, which provides both mobile and website apps (Mobasheri et al., 2017). Moreover, humans as sensors are the most important components to support Volunteered Geographical Information (VGI). VGI has great potential to fill gaps in the availability of digital information, empowering citizens to achieve that goal (Goodchild, 2007).
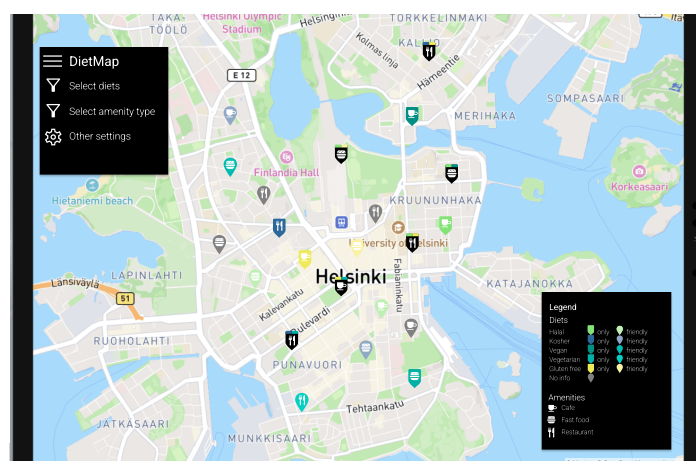
Figure 1. Preliminary symbolisation.
Source: Own work, Background map: © Mapbox © OpenStreetMap contributors

At the beginning of the user-centred design for this application development, we designed a mock-up for the app in mobile and PC desktop versions. To represent the main information, we symbolised restaurants, cafés, and fast food places, as

seen in figure 1 above. The wide-ranging combination of diets and amenity types from OSM makes a clear visualization of utmost importance.

Since we need to represent complex points of interest (POIs), a similarly complicated symbolisation is essential. Some visual variables are used in the form of figurative or pictorial symbols to show each data of the POIs based on the data type. Firstly, the amenity i.e. restaurants, cafés, and fast food places are nominal data types, so form or shape visual variable is used to symbolise them. Next, we differentiate the amenities which only serve a certain diet and those which serve a menu which is diet-friendly, for instance, vegan-only restaurants and vegan-friendly restaurants. This data can be seen as nominal data type, hence we use the form or shape visual variables to give associative perception (Roth, 2017). Moreover, to visualise the diet types, we use colour as a visual variable to represent the logo or familiar colour of each diet, which makes it easy for the users to identify diet types.

A preliminary user study as part of the user-centred design app has been conducted for at least two weeks to determine users' needs and feedback towards the app mock-up and symbolisation. Furthermore, we aim to define the target group of our app through this preliminary user study, which is participated by in total of 27 users. The user test comprises questions regarding users' general information, including the place where they live, users' diet and preference, the feedback on the initial design of the app, and what they expect from the app.

In figure 2 below, we asked users which scenario they prefer to have in the app interface. The result shows that scenario two is preferred. Afterwards, the users are asked whether they will contribute to adding and editing information in the app and contributing is appreciated. From both mock-up versions, the users chose to have the mobile app by 62.96% rather than a web app, whereas the rest of the users (37.04%) stated that either version would be good.
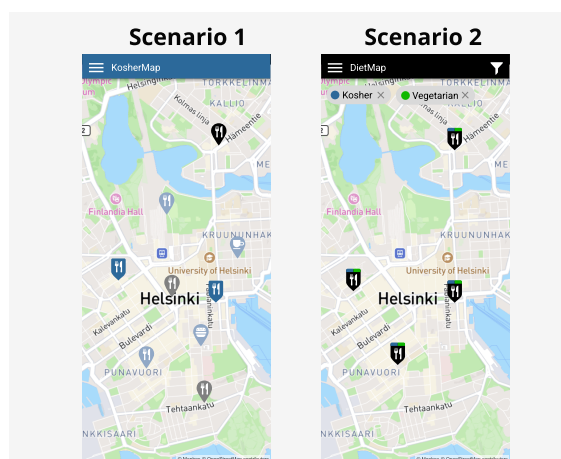

Figure 2. Scenario options. Scenario 1 shows a detailed map for users of one specific diet. Scenario 2 shows all the amenities, with their suitableness to different diets and a filter function.
Source: Own work, Background map: © Mapbox © OpenStreetMap contributors

From the preliminary user study, we concluded that if the diet is heavily used in the user's country, the app is not needed. For example, Halal in Indonesia, most of the users who are living in Indonesia stated that they do not need the app because it is easy to find restaurants which serve halal food. This is due to Muslim majority country and, therefore, halal diet followers. Meanwhile, people who live in Europe and follow gluten-free and vegan diets stated that they need the app, and it will be helpful for them. Therefore, we consider them as the main target group of our app.

In the next step of app development, we are eager to be concerned about visualization improvements, symbolisation and layer options. The ratings for each symbolisation are below 4.5 out of 5. The worst ratings are for vegan and vegetarian symbolisation because they have slightly similar colours and are difficult to distinguish. Next, we will develop the mobile app as the users prefer based on the preliminary user study, then continue the user-centred-design loop, ask users again after having the app, and improve further.

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