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Redressing the Exclusiveness. Challenges which Prevent New Users from Contributing to OSM

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Abstract

OpenStreetMap (OSM) is known as the most successful application in the field of crowdsourced Volunteered Geographic Information. Studies show that the vast majority of OSM contributors are middle-aged, well-educated males in stable employment. Accordingly, OSM data represents the worldview of a sharply delimited social group. To overcome this, it is necessary to identify the issues which prevent new user groups from contributing to OSM. This paper elucidates the problems behind these mechanisms and identifies the challenges of new users by focusing on the example of senior citizens.

Keywords:

OpenStreetMap, usability, challenges, exclusion, education

1 Introduction

The world's largest collection and therefore most successful initiative of crowdsourced open access spatial data is OpenStreetMap (OSM). Launched in 2004, OSM serves as a platform to produce user-generated spatial data and aims to involve the general public in data collection in order to close existing spatial data gaps. As Herfort at al. (2015) discuss, crowdsourced OSM data is seen as a promising alternative for obtaining and maintaining administrative and authoritative data. Going far beyond the OSM map itself, OSM data is used for a huge variety of applications and domains, e.g. urban and transportation planning, navigation and routing systems, user-centred applications for specific target groups, and even disaster management. While some of these domains primarily concentrate on the geometry data, others specifically aim at the availability of the attribute data collected and provided by the OSM community. Since the appearance of the demand for attribute data, it has become interesting to investigate the OSM community itself. Who, in fact, are the main contributors to OSM? And does the composition of the community affect the type of data and its quality?

2 OSM data: Who are the contributors?

There are several studies which go some way towards answering who is actively contributing to crowdsourced cartographic information (especially OSM), what motivations lie behind their participation, and what kinds of problem arise (e.g. Brown & Kyttä, 2014; Brown & Weber, 2011; Budhathoki & Haythornthwaite, 2013; Haklay & Budhathoki, 2010; Steinmann et al., 2013; Stephens, 2013; Vrbik, 2016). There are some characteristic common threads running through these studies, which can be summarized as follows:

1. The number of registered users is smaller than expected.
2. The majority of registered users never mapped or stopped the editing process before uploading the data.
3. Only a very small proportion of users (<10%) are actually mapping and thus contributing.
4. The group of people contributing to OSM is socio-structurally very homogeneous:
    a. the very vast majority of contributors are male
    b. the vast majority of contributors are well-educated (college degree or higher)
    c. the majority of contributors are aged between 20 and 50
    d. the majority of contributors have a stable employment and income.

3 The problem: unintentional exclusion mechanisms in the OSM community and data?

With these findings in mind, the following question arises: is there any direct link between the homogeneity of contributors and the quality and structure of the OSM data? As 'Critical Cartography' demonstrates, every map has associated intentions and becomes a catalyst of power regarding the map author's interpretational sovereignty over spatial meaning (e.g. Wood, 1992), and therefore the social construction of space through action (Werlen, 1993).

At first sight, OSM seems to be exempt from this effect: the exclusiveness of the interpretational sovereignty over spatial meaning seems to be relativized by the crowdsourcing background itself (bottom-up vs. top-down). Furthermore, investigations show that the main motives of OSM contributors are altruistic, rooted in a desire to provide a free digital map (Budhathoki & Haythornthwaite, 2013). In a nutshell: one could assume that OSM contributors have no intention to include personal interests in the map but 'just' want to help map the 'ground truth'. This assumption may be reasonable when focusing solely on information like land-cover classes or infrastructural objects. But when it comes to attaching attribute data to an object in OSM (by adding a tag consisting of a key and a value), the contributor's social background inevitably, even if unintentionally, influences his or her mapping action based on subjective interpretations and priorities. Traces of e.g. the under-representation of women (Budhathoki & Haythornthwait,e 2013; Haklay & Budhathoki, 2010; Steinmann et al., 2013) in the contributing OSM community can be found in the OSM data: even if the number of mapped kindergartens is very much higher than the number of mapped brothels, the number of different keys describing the subcategories of an object

varies in another direction: 9 keys for kindergarten[1] and 19 for brothel.[2] This is just one, admittedly very provocative but demonstrative, example of the imbalance of priorities caused by the homogeneous structure of the contributing community (for further explanations, see Stephens, 2013).

Such symptoms of exclusion may not be critical for mapping the ground truth, but they do result in problems regarding the equality of the OSM attribute data. The solution seems simple: the OSM community needs to become more heterogeneous, especially by recruiting new community members – people who are not male, people who are less than 20 or more than 50 years of age, people who are not well educated. To answer why these groups are so dramatically under-represented in OSM, it is necessary to identify the challenges which discourage them from contributing. The following insights focus on these challenges in the case of senior citizens, who are one of the under-represented socio-economic groups in OSM.

4 What prevents new users from contributing? An exploratory micro-study based on the user group of senior citizens

The challenges outlined in this section are rooted in observations made in two senior education courses on OSM basics held by the authors in 2015 and 2016.[3] Providing these courses allowed us to research these challenges and to get a deeper understanding of their nature and of the problems faced by the course participants. In contrast to studies based on surveys and quantitative methods (e.g. Schmidt et al., 2013), the results presented here rely on qualitative observations as well as documented conversations and discussions that took place during the courses.[4] The challenges identified and the problems behind them are explained below. These are actual concrete, exemplary situations. We make no claim to completeness, but the list of problems below allows understanding of the issues. This is in line with findings from qualitative social sciences: in order to understand the quality of a specific phenomenon, the exemplary structure of a use case and not its representability should be addressed (Patton, 2014).

[1] https://taginfo.openstreetmap.org/search?q=kindergarten#keys
[2] https://taginfo.openstreetmap.org/search?q=brothel#keys
[3] The two courses were provided within the initiative 'University 55PLUS' at the University of Salzburg, Austria. Established in 2012, this initiative allows women and men aged 55 and older to attend university lectures and courses based on personal interests, without formal barriers such as degrees. Currently, approximately 500 students are enrolled at the University 55PLUS, which offers more than 400 regular lectures and courses in various disciplines. The initiative includes lectures, IT courses, seminars and field trips designed specifically for University 55PLUS students. The demographic breakdown for the two OSM courses referred to here was, for 2015: 16 participants (4 female, 12 male); age: 56 and older; various professional backgrounds ranging from non-academic professions to PhD. For 2016: 15 participants (6 female, 9 male); age: 60 and older; various professional backgrounds, ranging from non-academic professions to PhD.
[4] Data sources were: face-to-face discussions during the course, online discussion of the learning management system, questions and concerns raised during the course, and feedback given by the participants. The authors documented this material, collected all challenges and problems directly linked to OSM, and allocated them to the categories outlined in the discussion below. Problems identified as trivial (like forgetting passwords or not finding hyperlinks) were excluded from this documentation.

Signup/ Login: The first issue that caused problems was a bit surprising, because it seems obvious that a personal account is needed to participate in an online platform and community. But based on several statements made by course participants, the signup was seen as a crucial barrier: creating an online account is perceived as critical due to issues of personal data privacy. In this case, the students were asked to use their university email accounts to sign up, and the tutors explained the necessity of each student having his/her own user account. But some students reported that they would not have signed up privately in a real-world scenario outside of the course.

Although it appears obvious that an account is required to contribute to OSM due to changelog, transparency and community issues, this barrier should be taken into account when aiming to recruit new users. Short, clear information must be provided (a) as to why an account is necessary, and (b) stating that OSM is a nonprofit organization and will not take advantage of, spread or misuse personal data.[5]

GUI and usability: Despite the availability of offline and mobile editors, the easiest and therefore most suitable way for beginners to contribute is by using the OSM online editors ID and POTLATCH 2. Although their user-friendliness has increased substantially over the last couple of years, there is still potential for improvements. These findings have already been stated by Behrens et al. (2015) and were confirmed in this study as well. For example, when adding a point, the pre-defined primary tags in ID may help when adding a feature suitable to these tags, but participants were confused when the intended category was not provided at first sight. A more detailed list would be helpful. Also, the dissimilar symbol design used in (a) ID, (b) POTLATCH and (c) the OSM map itself irritated the course participants. Another issue concerns the steps to be taken after saving the edits: the mandatory comment box unsettled the participants, because they did not understand its necessity. Switching back to 'normal' view, i.e. exiting the editing mode (by clicking the OSM logo in the upper-left corner) seemed quite complicated. For example, some participants complained that there is no 'stop editing' button.

In the context of the courses, these challenges were not particularly crucial because additional explanations and support were given by the tutors. But most of the participants stated that they would have abandoned their edits if they had not had tutor support. In conclusion, some small interface changes should be made, primarily addressing new and inexperienced OSM users (additional buttons and/or small popups with short explanations).

The tag structure of the attribute data: This challenge was identified indirectly, because explaining the tag structure of OSM was a substantial part of the course syllabus. Nevertheless, participants stated that the logic behind the tags is very confusing and challenging. One participant complained explicitly: 'Why do they not call it category and sub-category instead of key and value?' This statement shows that it is not necessarily the tag structure itself but the language behind it that is the key factor for improved understanding and usability.

[5] Although this information is given during the sign-up process at OSM, it can clearly be overlooked.

To conclude this issue, the essential information provided during the editing process needs to be improved. Succinct, to-the-point information would help greatly, written in language suitable for lay people and beginners, and avoiding (or at least explaining) technical terms like 'key', 'value', 'primary tag' and 'secondary tag'.

The Mapnik rendering: Immediately after adding or editing a feature, participants expected it to be directly visible in the OSM map based on the Mapnik renderer. As established users of OSM know, this is not the case: (a) the automatic rendering itself takes some time; (b) not every feature is visualized by Mapnik. This caused uncertainty, as most participants stated. They thought they had done something wrong and that their changes had not been applied. In the course setting, the tutors could relativize these anxieties by explaining the background framework of the rendering process and the two separate pillars of OSM, the map and – especially – the database. But, as most participants reported, in a real-life scenario this experience would have caused a high chance of drop-out due to the absence of a direct sense of achievement and the mistaken belief that 'something hadn't worked'.

To avoid such misunderstandings, it would help to provide direct feedback after the editing procedure (e.g. via a popup), (a) confirming the successful completion of the editing, and (b) briefly explaining the rendering background. Even if this is already the case, most participants did not recognize it as such. In conclusion, this alert should be provided more powerfully.

Perceiving the community as a closed system: A very crucial barrier for the course participants was the OSM community itself, as they perceived it as an exclusive and closed system. With the actual openness of the crowdsourcing approach in mind, this is surprising.

Firstly, students found it challenging to get in touch with the community. This is necessary when, for example, suggesting new symbols for the Mapnik renderer or suggesting/discussing new tag schemes for features not already listed in the informal tagging standards.[6] Confronted with such a situation, they were perplexed and did not know where to express their ideas and/or ask their questions. The tutors supported them by providing the links to the relevant forums etc., but participants reported that they would have failed to find the sites and correct procedures on their own. Here, it would help to provide succinct, relevant information at a spot where a problem occurs (e.g. via hyperlinks directly embedded in the online editor).

Secondly, one participant experienced an unsettling situation when they unintentionally made a mapping mistake and received a somewhat impolite email from an established OSM user. This was perceived as extremely demotivating due to worries about making future mistakes. Of course, this was a single case and is not a problem that can be solved structurally. But it is an issue that established community members should be aware of and take into account when communicating with novice members.

[6] The concrete case was the wish to specifically map public viewpoint binoculars. The recent tag scheme requires either 'amenity=viewpoint' or 'amenity=binoculars'. Participants were challenged in combining these tags and deciding which one should be the primary tag.

3 Conclusion

The challenges identified and explained in section 4 are similar to the barriers already found by Schmidt et al. (2013); they should therefore be taken seriously – even if they are not quantitatively reliable due to the exemplary approach taken here. In addition to discovering these critical issues and understanding them more deeply, the qualitative approach allowed for brief recommendations to be given for how to handle them. At the root of all the challenges identified is a question of information. Even if the OSM Wiki (http://wiki.openstreetmap.org) already provides detailed and well-documented material, it is essential to deliver the necessary information succinctly and at the point where it is required. This can be accomplished e.g. by small GUI adjustments, as outlined above. This may sound trivial, but it is crucial: the course participants stated that each of these barriers individually would have had a high probability of preventing them from continuing. The interaction of more than one of these challenges with each other would cause a high drop-out rate of potential new contributors.

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