Understanding Challenges in Contributing to Wikipedia in Amharic, Tigrinya, and Afan Oromo.

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Wikipedia is a free encyclopedia available in over 300 languages and has over 191 million articles in total. The vision statement for Wikipedia is to be a platform where "every single person on the planet is given free access to the sum of all human knowledge." But despite this vision, not all languages are represented the same.

Languages that do not have a lot of digitally available data are commonly referred to as ‘low-resource’ languages. This category includes the majority of African languages, including Ethiopian languages. In this work, we specifically studied challenges in Afan Oromo, Amharic, and Tigrinya Wikipedia. Since these languages are not referred to as ‘low-resourced’ in their own words, we will instead address each language with its own name in the remainder of this article or use descriptions of the lack of data more generally. We hope this will avoid legitimizing the terminology and the way community members refer to their own languages in their own terms.

To understand the challenges faced by WIkipedia contributors in languages that do not have a lot of data available, we conducted a study where we (1) analyzed data from Wikipedia forum discussions and (2) observed 14 participants attempt to write an article in either Tigrinya, Afan Oromo or Amharic. Based on our findings, we provide design recommendations for building inclusive language technologies. In this article, we provide the summary of findings from our publication which can be accessed here.

Current State of Wikipedia for Amharic, Tigrinya, and Afan Oromo.

Overall, we observed that Wikipedia in the three languages suffers in terms of quantity, quality, and relevance. In terms of quantity, we observed that there is a significant gap in the number of articles available for the three languages. There are 304 articles on Tigrinya Wikipedia compared to over 650,000 in Arabic. There's also an alarmingly low number of new articles per day and active editor count for these languages compared to their higher-resourced counterparts.

Wikipedia also suffers in terms of quality when it comes to languages with limited available data. In Figure 1a, we see a screenshot of an article in Tigrinya Wikipedia with the title history that has one word, the name of an individual. Figure 1b shows an Amharic Wikipedia article with the title “Ethiopian history”, which is one long sentence describing the location of a town in the Tigray region. Zooming out, we see that most articles in these languages have one sentence as observed by the peaks in their respective graphs in Figure 2. For comparison, we observed Arabic has a peak at around 10 sentences. We also observed that for these three languages, the maximum number of sentences per article is in the tens or hundreds, while for Arabic it's in the thousands and tens of thousands.

Figure 1a. Screenshot of an article from Tigrinya Wikipedia.

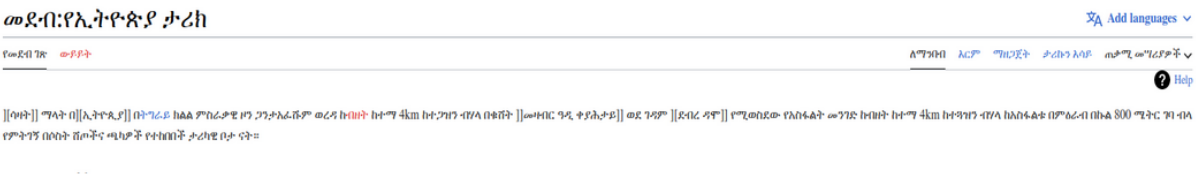


Figure 1b. Screenshot of an article from Amharic Wikipedia.

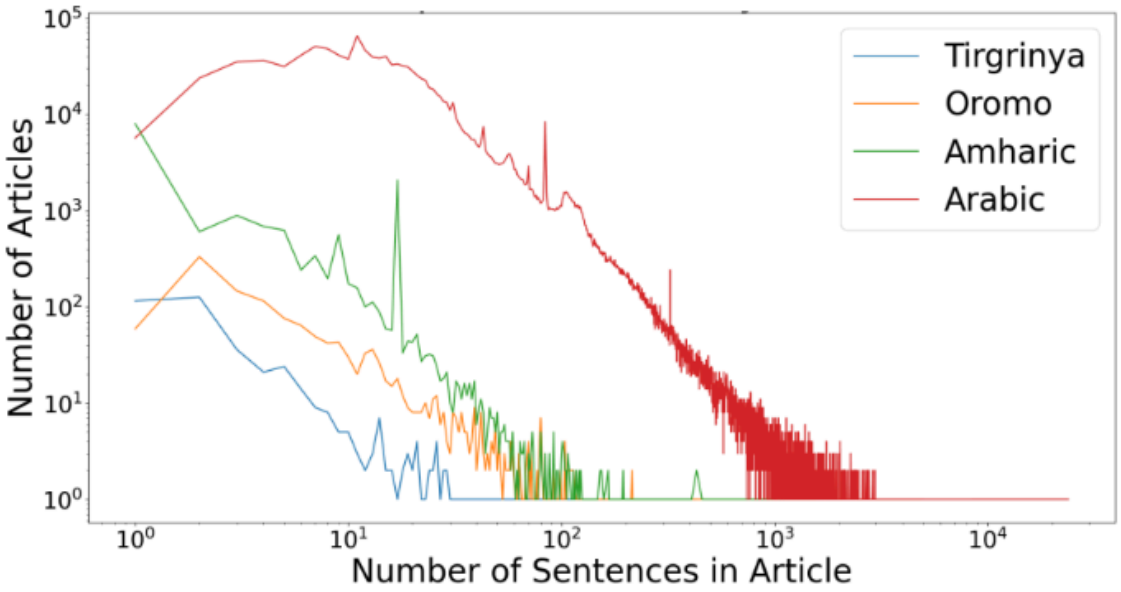
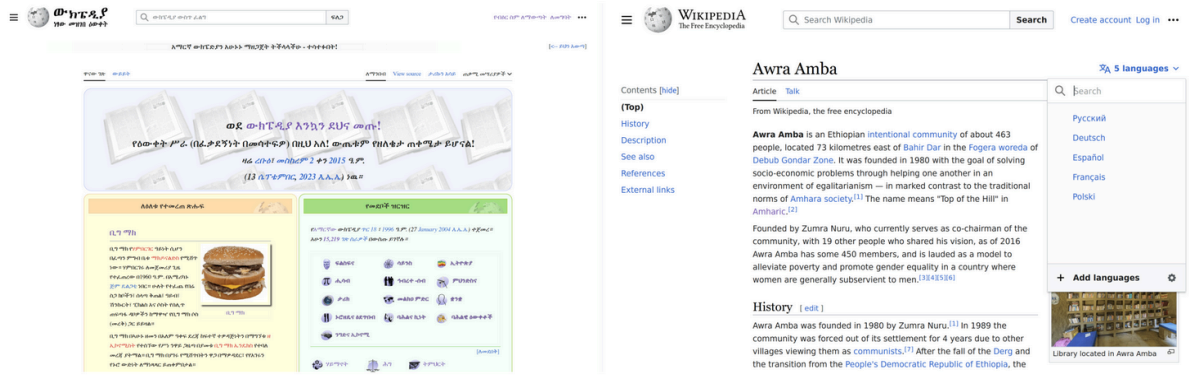


Figure 2. Plot showing the distribution of sentence count per article for Amharic, Tigrinya, Afan Oromo, and Arabic Wikipedia.

Wikipedia in such languages also has relevance issues. Figure 3 shows a screenshot of an article on the main page of Amharic Wikipedia, which is about the Big Mac burger, although

there is no McDonald's restaurant in Ethiopia at the time of writing this article. On the other hand, an article about a famous Ethiopian community, Awra Amba, is available in six languages, none of which are Ethiopian.



(a) Amharic article about the Big Mac burger.

(b) English article about a famous community in Ethiopia.

Figure 3. Fig. 3a shows an article on the main page of the Amharic Wikipedia about the Big Mac burger even though there are no McDonald's restaurants in Ethiopia. On the other hand, an article about a famous Ethiopian community, Awra Amba (Fig. 3b), is available in five languages on Wikipedia, none of which are Ethiopian languages.

Methodology

Given the deficiencies in Wikipedia for the three languages mentioned above, we asked the research question, "What challenges do contributors who speak those three languages face when interacting with online knowledge repositories?" To answer our research question, we conducted two studies. In study one, we collected forum discussion data and used inductive thematic analysis to understand challenges discussed by Wikipedia contributors. Since contribution in these languages is low, we conducted a contextual inquiry study with 14 novice contributors to understand the barriers to entry in this space.

Findings

When we conducted these studies, we went in thinking we're going to find out exactly what is wrong with Wikipedia for these languages. It turns out that the barriers are due to distinct but interacting challenges spanning Wikipedia's interface, language support tools, and socio-political challenges.

Wikipedia's interface challenges.

1. Wikipedia interface would sometimes have instructions mixed in local languages and English. For instance, in a screenshot with one of our participants displayed in Figure 4, the permission error says “You are not allowed to create this page due to the following reasons” in Tigrinya and proceeds to list the reasons in English.

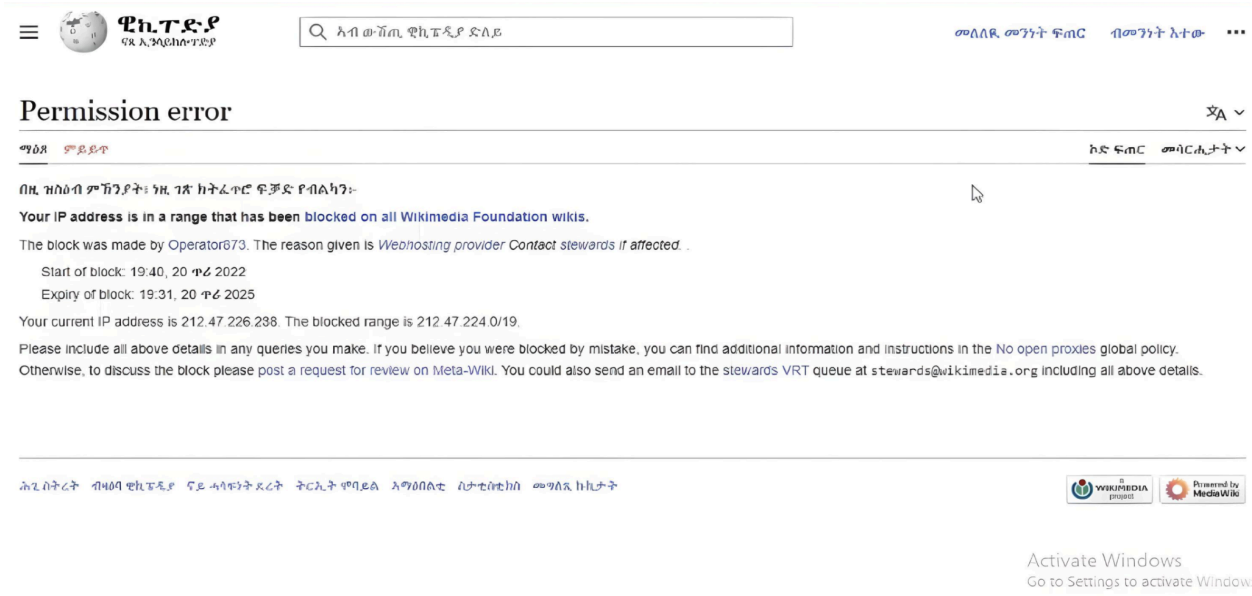


Figure 4. Permission error in Tigrinya Wikipedia with a mix of instructions in English and Tigrinya.

2. Technical and scientific terms in the local languages are not familiar to the contributors. We observed our participants struggling to understand what the terms on the buttons and links meant and had difficulty finding the right links to perform an action. Some of our participants associated this with dialects, indicating that the term “may be from another dialect.” Additionally, participants indicated that some of the terms were too literal or not used in everyday conversation.
3. Information is not available in a contained, direct place. We observed that our participants had to search outside of Wikipedia to perform certain actions, for example, to add an image to an article.

Support Tools for Languages

1. Writing digitally with Ge’ez script is difficult. Participants used 7 different types of keyboards and all had their own set of challenges. In our forum analysis, we found that contributors found it time-consuming to use Latin-based keyboards to write in Ge’ez script.
2. Oral traditions are lost in the current mode of online knowledge preservation. Participants raised the concern of leaving out stories and knowledge preserved through oral traditions when we strictly adopt the written format of online knowledge preservation.

3. Machine translation tools lack cultural relevance and introduce bias and toxicity in outputs. When our participants used machine translation tools, we observed that the outputs lacked cultural relevance, for example, translating idioms like ‘ehel wehachen aleke’ literally. Machine translation tools also do not account for the calendar system of Ethiopia. Hence, for articles with year in them, the translation output will not indicate what calendar system is used or convert it to the Ethiopian calendar, resulting in confusion for historical articles.

Socio-political issues.

1. Cyber-security measures block VPN activity; contributors use VPN due to political issues. Several of our participants were blocked from contributing to Wikipedia due to their connection with VPN services. However, the participants connected to VPN because platforms like Telegram and YouTube were blocked in Ethiopia at the time we conducted the sessions.
2. There are limited scholarly articles available about the communities and even fewer in the languages. We observed that our participants had a difficult time finding scientific articles to corroborate their articles. First, there is a lack of scholarly resources generally about the communities. Second, even when there are resources, they are available in English or other European languages. “See, it is the Harolds of the world!” one of our participants said when looking at the list of references in an article about Aste Yohannes.
3. There are financial barriers to contribution. Our participants raised how they have a hard time accessing publications that are behind paywalls when trying to produce knowledge in their languages or about their communities. In our forum analysis, we observed that one of the contributors raised the issue of requiring mobile data top-up to connect to the internet so they can contribute in their language.

Building inclusive technologies

A. Wikpiedas interface: Based on the challenges we observed, we see avenues for improving Wikpieda’s interface for these languages. For instance, Wikipedia could use Langauge Indentification technology to automatically flag articles and pages with mixed languages. Wikipedia could also allow contributors to add the dialect they are contributing an article in, so that people who create the article in a different dialect, which may have a different spelling for instance, will avoid repeated efforts.
B. Machine Translation: Researchers could add features to Machine Translation tools that would allow for structured conversions of dates and years so articles can remain historically accurate. There is also room for research in reducing toxicity and bias for translation in these languages.
C. Input Modalities: There is potential to use Automatic Speech Recognition systems for going from voice to text for these languages, instead of relying on Latin-based keyboards for the input of text into online knowledge repositories. Additionally, contribution in poor voice format, without the need to convert to text could also allow for the inclusion and preservation of knowledge primarily transferred through oral traditions.

Conclusion

In this paper, we looked at the challenges that contributors face when attempting to write in Amharic, Afan Oromo, and Tigrinya on Wikipedia. Based on our analysis, we propose a set of design opportunities for building inclusive language technologies. We will end this article by emphasizing that it should be the decision of community members and speakers of languages whether or not they want to contribute to online knowledge repositories like Wikipedia. Currently, our design of various technologies and socio-political issues result in barriers to contribution. Our work does not claim that communities need to contribute to WIkpieda or any other knowledge repository. Rather, we should strive to build inclusive technologies and leave the choice of contributing–or not contributing–to speakers of the languages.