

To be or not to be... a Nahuatl language learning App. The long-term survival or discontinuation of indigenous language learning apps on the example of Nahuatl

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Abstract

Language learning apps for indigenous languages differ from the mainstream language apps in that they are not targeted at commercial success and might need to accommodate different linguistic and cultural aspects than the most learnt languages. The present paper considers the present and past Nahuatl language apps, some of which were discontinued, and asks what would be necessary for such apps to achieve long-term survival.

Keywords

Language learning, human-computer interaction, software usability, software translation, trends in software development

1 Introduction

The strong digitalization of modern life is bringing about big changes to the global and local societies. One of the results of the technological changes is the rapidly ongoing globalization, and one of the mechanisms of globalization is the shift of communities from languages with small numbers of speakers to a smaller number of global languages. In many countries with colonial history, this follows centuries of, at best, ignorance of, and at worst, active discrimination and eradication of the indigenous populations, their languages and their cultures.

The dominance of global languages is clearly seen on the Internet, where 80% of websites are written in just 8 of the estimated 7000 world's languages [1]. The ascension to the digital realm is a challenging task and in 2013 [2] estimated that, at best, 5% of the world's languages will ascend to the digital world, and the rest will suffer a "digital language death".

One of the ways a language can be present on the internet is by being the object of mobile learning apps. Mobile apps supporting the acquisition of minority and indigenous languages may differ from apps targeting global languages in that minority language learning apps would typically not be aiming at commercial success, would have lower budgets, or even be done on volunteer basis by smaller group of language activists.

In addition, by pure chance, many of the most learnt languages have less complex morphology than many minority languages, and the apps that were developed with more analytic languages in sight, such as English, are not easily fully extendable to Morphologically Rich Languages, such as isiZulu [3], Turkish [4] and Nahuatl.

In the following, the focus lies on Nahuatl, the Mexican indigenous language with the highest number of speakers, 1.5 million. Nahuatl is one of 68 indigenous Mexican languages, and despite its historical prestige remains endangered, a challenge it shares with virtually all indigenous American languages. Nahuatl language learning apps contribute not only to thwart its digital death, but also to increase its visibility and prestige, and to support the efforts of Nahuatl learners to become "new speakers" [5] of the language. The role of new speakers is described as "very important, often essential for language revitalization projects" by [6] who work directly with Nahua and other minority groups in Mexico.

2 Initiatives to Localize Software and Platforms in Minority Languages

The second decade of the 21st century was a witness of increased efforts to increase the visibility and presence of minority and indigenous languages in the digital sphere. These were often led by digital language activists and sometimes supported by the companies whose software was the focus of the projects. The present section describes some of the initiatives taken and discusses the long-term results of the work to promote indigenous languages. Particularly, it looks at whether the work of the activists resulted in a long-term inclusion of the relevant language in the software or platform that was the aim of their efforts.

The Mozilla Foundation, known for its web browser, Firefox, launched in 2012 the initiative "Native Mozilla" that aimed to localize the browser into many of America's indigenous languages. 50 languages from 10 countries were targeted [7], many of which are spoken in Mexico, such as Ch'ol, Kaqchikel, K'iche', Mixteco (2 varieties: of Mixtepec and of Yucuhiti), Nahuatl (2 varieties or, by other accounts, 2 closely related languages: Highland Puebla Nahuatl of Mexico and Nawat Pipil of El Salvador), P'urhépecha and Triqui [7, 8]. The translations are done via the collaborative translation platform Pontoon (<https://pontoon.mozilla.org/>). As part of the initiative, for example, a Hackathon was organized in Oaxaca in 2018 with representatives of 15 languages [8].

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However, the goal of providing translations into 50 American languages is far from achieved and, as of 30.09.2024, Firefox 115 was available only in three American Indigenous languages: Kaqchikel and Triqui spoken in Mexico and in the South American language Guarani [9]. The other languages are in various state of completion: Ixil (13%), Kichwa (0%), Miahuatlán Zapotec (14%), Mixtec of Mixtepec (9%) and of Yucuhiti (29%), Nahuatl pipil (0%), Paipai (1%), P'urhepecha (9%) and Quechua (3%). The situation is slightly better for the mobile phone browser Firefox Focus, which is available in Aimara, Ixil, Kaqchikel, K'iche', Maya, Miahuatlán Zapotec, Mixtec of Mixtepec and of Yucuhiti, Nahuatl pipil, Navajo, Paipai, P'urhepecha, Quechua, Tének and Triqui [7, 10].

There were also attempts to localize the social media platform Facebook (<https://www.facebook.com>) into minority and indigenous languages. In 2012, the official Facebook translation platform (<https://www.facebook.com/translations/>), where users could add and vote on the accuracy of volunteer translations, had partial translations in about 100 languages, including Cherokee [11]. However, frustrated with the slow progress, Manuel Neskie made a browser overlay that allowed the translation of Facebook menu into Secwepemctsin directly in the user's browser [11], which was later extended to many other languages, including Nawat [12] spoken in El Salvador. In 2015, a group of activists translated 24 000 words into Aymara and submitted it to Facebook for revision [13]. However, as of 31.08.2024, same as on 07.04.2019 [14], only three indigenous American languages were available for menus on Facebook: Cherokee, Inuktitut and Inupiaq, and the Facebook Translation App appears to have been discontinued.

A similar fate was met by the attempts to increase the number of languages offered on the Duolingo language learning platform (<https://es.duolingo.com/>). As of 10.06.2024, two indigenous languages are available on Duolingo: Hawaiian and Navajo [15]. However, previously also Guarani must have been available on the app, as evidenced by the surprise some users expressed at its sudden lack [16, 17]. The course is still available on the website version as of 31.08.2024 [18]. Between 2013 [19] and 2021 [20] new courses in development were stored in the Duolingo Incubator, where the users themselves could contribute to adding new languages to Duolingo. Indigenous languages such as Yucatec Maya and K'iche' were present on the Incubator and Duolingo itself credits the volunteers for helping to make, among others, the Navajo and Hawaiian language course [21]. However, Incubator was discontinued in 2021.

As we have seen, a common trend in the translation efforts of Facebook and Duolingo is the move from community and volunteer-based translations to commercial translation directed by the company. On the one hand, the reliance on unpaid work is problematic for a company with huge profits – something that Duolingo itself lists as the reason for ending the volunteer program [21]. This is especially true when those delivering this work might already be in unprivileged financial situation, as many indigenous language speakers are. On the other hand, however, this deprives the communities of the possibility to contribute to making their language more visible on the popular platforms. It is interesting to note that the translation platform of open-source based Mozilla products remains active, and, for example, the last changes to an Indigenous Language – Zapotec – have been done on 26th August 2024.

3 Digitally available Nahuatl language media

The importance of maintaining Nahuatl language learning apps is clearer if we consider that there are relatively few other resources in the language available online for language learners, many of whom are descendant from Nahuatl speakers and wish to reclaim the language of their ancestors.

[14] collected information about the different monolingual Nahuatl language media available for those searching on the internet. The results encompassed 12 monolingual novel-sized books, 5 scientific articles, 10 movies or series episodes, 1 videogame, 6 radio stations where Nahuatl is transmitted along with other languages, Wikipedia in 10 separate varieties, and 5 websites with a Nahuatl version. Considering that Nahuatl is the Mexican indigenous language with the biggest number of speakers, this is a low number.

However, there is hope that their number is increasing. For example, the 5 scientific articles were published in 1959, 2019, 2022, 2022, 2023; the 12 books in 2008, 2013, 2014, 2015, 2015, 2016, 2017, 2017, 2017, 2019 and 2021, (the twelfth is the Bible which has been translated into many varieties) [14]. One of the websites is also recent, as it was published in 2023 [22]. In 2024 the Mexican presidential election was simultaneously interpreted into Nahuatl, and remains, as of 30.08.2024, available on YouTube [23]. In addition, a Master's degree in Nahuatl language and culture, taught completely in an indigenous language was launched in 2019 [24], first of its kind. We see therefore a clear tendency of growth, and it could be expected that more media will become available in Nahuatl soon.

It is also interesting to consider the case of the work to bring Nahuatl as a language available in Google Translate (<https://translate.google.com/>). In 2010, Google announced their plans to add Nahuatl and Maya to the tool [25], but this service was finally only introduced in June 2024 [26]. As of September 2024, the following ten indigenous American languages are among the 243 languages available on Google translate: Aymara, Guarani, Hawaiian, Kalaallisut, Mam, Nahuatl, Quechua, Q'eqchi', Yucatec Maya and Zapotec.

Considering mobile apps in particular, [14] identified 39 mobile phone apps related to Nahuatl. Most of them, 23, are Bible apps, although due to double versions, there are only 14 different variant versions of Bible available as a mobile app. The other 16 apps include 6 dictionaries (one with a Nahuatl user interface), 3 text collections, a (faulty) automatic translator, a multi-component app CEM, which combines dictionaries and morphological analyzer, the messaging app Telegram that offers user interface in Huasteca Nahuatl (albeit cannot be chosen in its standard menu, but is available for download for those who have the relevant link), and, finally, 4 Nahuatl language courses, discussed below.

4 A Partial History of Nahuatl Language Apps

As of 01.07.2023, four Nahuatl language courses were available for Android [14]: Aprende náhuatl [27], Beginner Nahuatl [28], Kamatlama [29] and NahuatlApp [30]. Aprende náhuatl (Spanish for “learn Nahuatl”) is a vocabulary training app, with texts and videos, produced by the National Institute of Indigenous Peoples, a government agency and it was, as of 01.07.2023, downloaded more than 10 000 times [14]. As of 26.09.2024, it is available on

Android 14 for some, but not all devices. Beginner Nahuatl, with more than 1000 downloads as of the same date [14], was a vocabulary training app, without any game elements. Kamatlama is an app introducing basic numbers and fruit names and testing them through games and it was downloaded only more than 50 times as of 01.07.2023 [14]. NahuatlApp was an app introducing vocabulary items and testing them through a game and had, as of the same date, more than 10 000 downloads [14].

It is notable that the maintenance of the apps is far from ideal. Between the data collection of [14], 01.07.2023 and of [31], 30.05.2024, the videos of Aprende Nahuatl became unavailable and the two apps, Beginner Nahuatl and NahuatlApp, became unavailable for download on Google Play. During the same time, the user statistics did not change for the two continued apps, and crucially, Kamatlama hasn't reached 100 downloads.

Two more apps mentioned by [14], although primarily dictionaries, also have elements supporting learning, such as quizzes: Totlahtol Nahuatl [32] and Diccionario Náhuatl [33]. As of 26.05.2024 Totlahtol Nahuatl, which offered Nahuatl user interface – as the only app other than Telegram – was no longer available for downloads, while Diccionario Nahuatl is still (01.09.2024) available. Additionally, Miyotl, a multilanguage app whose lesson components seem to never have been completed, remains available for download and contains a list of Nahuatl words and their Spanish translations [34].

In addition, as of 01.09.2024, 6 other apps mentioned by [14] are discontinued: the text collection Tlapohualiztli [35], the dictionary Diccionario Maya y Nahuatl [36] and the automatic translator Traductor Nahuatl [37]. This means that out of 16 non-Bible related apps mentioned by [14], 6 (Beginner Nahuatl, NahuatlApp, Diccionario Maya y Nahuatl, Tlapohualiztli, Totlahtol Nahuatl, Traductor Nahuatl) have been discontinued only a year later (37.5%). In addition, [31] mentions three other apps that had been discontinued before: Tozcatl [38], Nahuatl Grammar [39] and Ma Tiwelikan Nawatl [40] – the latter is available as a website, but the App version is not available anymore. Furthermore, the app presented at the EUROCALL conference in 2016 [41] is also not discoverable on Google search, as of 18.06.2024.

However, the changes are not all negative. On 14th March 2024, user ItztliEhecatl posted on the social platform Reddit [42] that they have created a new Huasteca Nahuatl language learning course [43]. The author has been adding new items to the course, and as of 01.09.2024, there were 568 words and phrases to be learnt. The Huasteca Nahuatl course uses the Memrise Community Courses infrastructure, where users can create their own courses. However, in line with the trend discussed in section 2, Memrise is also closing community forums and removing community courses from their app and the future of the community courses remains uncertain beyond the end of 2024.

There is, however, another high-quality Nahuatl learning app for beginners that explains the grammatical concepts and tests them in a variety of exercises over 11 Units: the Nahuatl course hosted by the 7000 languages organization [44] and prepared in 2017 by Tlahtolapazolli, a Los Angeles based group [45]. The course requires registration, and only has a website version – although the mobile website version works well. However, the fact, that it is not listed in App stores decreases its findability.

Altogether, we see here that a great proportion of Nahuatl learning apps is discontinued. By the time they this happens, their

content usually does not advance beyond the basic level, although one often has the impression that the authors had intended to add more lessons in the future. One could wonder whether a more stable app with more levels would have been possible if the authors had joined their efforts.

5 Long-term survival of Language apps: Discussion

The trajectory of some Nahuatl learning apps has helped us identify a trend of frequent discontinuation of those apps, lack of maintenance or upgrading to newer versions of operating systems or devices and a tendency by the commercial providers to dissolve community-led efforts of translation and localization and to limit the number of languages that the service is translated and localized into.

Admittedly, the frequent appearance and disappearance of new apps might be a sign of a vibrant, creative community. In fact, [7] sees it as a part of the process of app creation to accept that the results of one's work on software localization might have a short life or never be used at all. If one accepts the possibility of failure (that is, the materials prepared ending up not being used) or only short-term success (that is, a short-lived app), the process of creating apps might be more spontaneous and less restricted, and the threshold to make such an app might be lower. In other words, if one does not strive to make "the perfect" app, creating an ad-hoc training exercises for one skill might become easier. However, even in this scenario, many contributors and authors might end up doing the same work unnecessarily, such as preparing grammatical description of the same grammatical forms destined for different apps.

In addition, one might also wonder if the low number of downloads discourages the authors to add additional levels and update their apps. However, given that Aprende Náhuatl, an App published by a government agency had more than 10 000 downloads, and up to 28 000 downloads [46], there is sufficient interest of learners in Nahuatl language apps, and perhaps a focus on better findability of the apps could result in their bigger success.

The question can therefore be posed how to better direct the efforts of authors and contributors, typically activists and volunteers, to not repeatedly make basic-level apps that might then be discontinued and to instead direct those efforts at more long-term apps which would also include levels for more advanced learners.

An open source platform that allows and tracks user edits, similar to Wikipedia (<https://www.wikipedia.org/>) or Wikitravel (<https://wikitravel.org/>) could allow users to collaborate in making language courses, and each individual author could make a small contribution, without the feeling that it was "in vain". This would also prevent the fruits of work of language activists from "disappearing" in the chaos of the internet, and would increase their findability. Care must be taken to make such a platform independent of commercial companies that could unilaterally delete the courses from their servers. It is also recommended that information about such a platform be widely shared to avoid the situation where a good course ends up not being used due to being unknown to the learners.

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