MOZILLA IN P'URHÉPECHA: TRANSLATORS' AGENCY IN A SOFTWARE TRANSLATION PROJECT

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Abstract: In an effort to preserve and encourage the use of endangered languages, the last decade has witnessed the emergence of transnational projects funded by technology and software development companies such as Google and the Mozilla Foundation. Launched in 2012 by the Mozilla Foundation, the project 'Native Mozilla' is aimed at creating a more inclusive digital environment by developing web browsers and applications that will facilitate internet access and use to Latin American indigenous populations. A group of community users, translators, language teachers, developers, activists and other organizations have been particularly active in the translation of Firefox and Firefox Focus, Mozilla's browsers for PC and Android, in 50 indigenous languages from Argentina, Bolivia, Chile, Colombia, Ecuador, Guatemala, Mexico, Paraguay, and El Salvador. P'urhépecha is the main indigenous language of the state of Michoacán, Mexico. Spoken by nearly 120 000 speakers is considered as a threatened language. This article focuses on the translation project of Firefox Focus to P'urhépecha that took place from November 2014 to November 2018, and that involved the participation of P'urhépecha language and culture teachers, and students and alumni of the BA in Intercultural Language and Communication. In addition to describing the merits and shortcomings of the project, we will examine the translation and the training process. We will be arguing that the limited literacy in P'urphépecha shaped the role played by the working languages, thus influencing their translation choices and strategies.
Keywords: Software Translation; Translation Training; Threatened Languages; P'urhépecha Translation

MOZILLA EM P'URHÉPECHA: AGÊNCIA DE TRADUTORES EM UM PROJETO DE TRADUÇÃO DE SOFTWARE

Resumo: Em um esforço para preservar e incentivar o uso de línguas ameaçadas de extinção, a última década testemunhou o surgimento de projetos transnacionais financiados por empresas de desenvolvimento de tecnologia e software como Google e Mozilla Foundation. Lançado em 2012 pela Fundação Mozilla, o projeto 'Native Mozilla' visa criar um ambiente digital mais inclusivo, desenvolvendo navegadores e aplicativos da web que facilitarão o acesso e uso da Internet para populações indígenas latino-americanas. Um grupo de usuários da comunidade, tradutores, professores de idiomas, desenvolvedores, ativistas e outras organizações têm sido particularmente ativos na tradução do Firefox e Firefox Focus, navegadores da Mozilla para-PC e Android, em 50 idiomas indígenas da Argentina, Bolívia, Chile, Colômbia, Equador, Guatemala, México, Paraguai e El Salvador. P'urhépecha é a principal língua indígena do estado de Michoacán, no México. Falada por cerca de 120 000 falantes é considerada uma língua ameaçada. Este artigo centra-se no projeto de tradução do Firefox Focus para P'urhépecha que decorreu de novembro de 2014 a novembro de 2018, e que contou com a participação de professores de língua e cultura P'urhépecha, e alunos e ex-alunos da Licenciatura em Linguagem e Comunicação Intercultural. Além de descrever os méritos e deficiências do projeto, examinaremos a tradução e o processo de treinamento. Argumentaremos que a alfabetização limitada em P'urphépecha moldou o papel desempenhado pelas línguas de trabalho, influenciando assim suas escolhas e estratégias de tradução.
Palavras-Chave: Tradução de Software; Formação em Tradução; Idiomas Ameaçados; Tradução de P'urhépecha

Introduction

There are 62 indigenous languages in Mexico. Approximately 6.8 percent of the national population speak an indigenous language and approximately 85 percent of those speakers also speak Spanish. This linguistic diversity contrasts sharply with the lack of recognition of indigenous languages interpreting and

translation practices, as well as with the little efforts done towards the training and certification of both translators and interpreters. To some extent, these conditions are a reflect of the precarious circumstances of most of indigenous people (according to the National Council of the Social Development Policy Evaluation (CONEVAL, 2018), in 2018 41.9 percent of the population (52.4 millions) and 7.4 percent (9.3 millions) were living in poverty and extreme poverty respectively); and the result of a linguistic policy that historically has favored a monolingual national state[1].

Encouraged since the colonial period, monolingual policies, aimed at the cultural assimilation of the indigenous population to the mestizo and continued during the Post-revolutionary years and, to a large extent, throughout most of the 20th century[2]. In 1936, bilingual education was recognized in the Mexican constitution. This eased up the arrival of William Cameron Townsend and the Summer Institute of Linguistics (SIL)[3]. The main aim of both the government and SIL was to "Castilianize" the indigenous population or, at the very least, to make them bilingual. The positive results of Proyecto Tarasco led the then president of Mexico, Lázaro Cárdenas to invite the SIL to Mexico and to support the

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[1] With significant variations throughout time, this approach has been perpetuated since the colonial period where the Spaniard colonizers efforts to establish a linguistic hegemony that imposed Castilian as official language contrasted with a lack of a coherent language policy to do so. On the other hand, the Spanish crown did little to support and encourage the use of the languages of the Mexican natives, and it hoped that the missionaries will teach them Spanish. After the independence in 1821, the linguistic situation of the Mexican natives did not change much, quite the contrary, the new ruling elite, composed mostly of Creoles and Mestizos did not respect the property right of the indigenous population and they began to strip them off their lands (see, for example, Jauregui, 2014; Skrobot, 2014, p. 44-50). Likewise, the post-revolutionary period (1920-1930) witnessed a second push when in an attempt to "mexicanize" the indigenous population the Mexican government

[2] 'Proyecto Tarasco' was but an exception to this policy.

[3] Specializing in Cakchiquel and Nahuatl, Townsend authored a number of books and articles on Cakchiquel grammar, languages and on Mexico's oil and president Lázaro Cárdenas.

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organization of the first Interamerican Indigenist Conference in Pátzcuaro, Michoacán in 1940[4]. The conference led to the creation of the Inter-American Indigenist Institute (1942) as well as to the launch of three journals specializing in the study and dissemination of indigenous cultures and of the activities of the Institute: *Boletín Indigenista* (1941-1961), *América Indígena* (1941-1998), and *Anuario indigenista* (1960-1996). Overall, these publications and institutions contributed to the emergence and consolidation of new linguistic and social policies and institutions towards the indigenous communities[5]. In 1945, the Ministry of Public Education created the Instituto de Alfabetización en Lenguas Indígenas [Institute for Indigenous Languages Literacy], which later on was renamed Instituto de Alfabetización for Monolingual Indigenes. This institute trained 50 bilingual teachers to prepare texts in Tarasco [P'urhépecha][6], Nahuatl, Otomí and Mayan. In 1948, the National Indigenous Institute was created. Amongst other activities, the NII supported bilingual literacy. Between 1964 and 1976, the INI trained more than 14,000 teachers to carry out the bilingual and bicultural training of indigenous kids (Desmet Argain, p. 112).

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[4] The issue was discussed again at the Pan-American Conference celebrated in Montevideo (1933) and at the First Indigenous Peasant Conference of Mexico (1935). In 1937, represented by Maxwell Lathrop and his wife Elizabeth, the SIL began researching P'urhépecha. Lahtrop published "72 texts, 35 of which are devoted to the translation into P'urhépecha of biblical passages and the rest has pedagogical purposes" (Chamoreau, 2009, p. 336-337). Other members of the SIL published articles and texts on P'urhépecha in 1946 and 1974. The contribution of the SIL for the preservation and dissemination of this language is limited as the main purpose of this institution has been the conversion to Christianity.

[5] Based in Mexico City, the Inter-American Indigenist Institute, was created to "elucidate the problems affecting the Indian groups", "initiate, direct and coordinate any scientific investigations and inquiries applicable to the solution of Indian problems" (Inter-American Indigenist Institute, 1940, p. 661-663) and to improve the situation of the indigenous population across the continent (Castillo Ramírez, 2019, p. 151).

[6] An oscillation between 'P'urhépecha' and 'Tarasco' has been registered since the early texts published in the 16th century (González Ambrosio, 2018, p. 24). We have opted to use 'P'urhépecha' as is the word currently accepted and recognised by the community itself.

Gradually, the indigenes gained influence and in 1983 they could regulate the public education that was destined to the Indigenous Population. This increasing influence finally materialized in a new model that was called Indigenous Education Bilingual and Bicultural which claims that "the education of ethnic groups should be given in their own languages […] and the content of this education should be bicultural, i.e., it should also include elements of the students' culture and of the national culture" (Acevedo Conde, 1996, p. 200). To some extent the first signs of change are not visible until the January 1st 1994 when, amongst other claims, the Zapatista Army of National Liberation (Spanish acronym, EZLN) demanded a new educational policy that could account for the cultural and linguistic diversity of the country and that could lead the indigenous population into the 21st century. In addition to changes to the Articles 2nd and 4th of the Mexican Constitution, the promulgation of the General Law of Linguistic Rights of Indigenous Peoples in 2003 are considered as a positive aftermath of the EZLN uprising (Barriga Villanueva, 2019, p. 39; Desmet Argain, 2008, p. 115). The Law of Linguistic Rights is aimed at promoting, via schooling, the knowledge of Mexico's linguistic plurality and respecting the linguistic rights of the indigenous population by guaranteeing the access to education in all the indigenous languages. However, there is still a pressing need to adopt effective actions to preserve these languages and to give them actual currency in the modern life.

The Instituto Nacional de Lenguas Indígenas (National Institute of Indigenous Languages, INALLI, Spanish acronym) was created in 2003. With varying results[7], the INALLI has focused on protection and support of Mexican indigenous languages via the training of interpreters. The ethnologist Margarita Warnholtz Locht argues

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[7] The fact that the number of endangered Mexican indigenous languages since the creation of INALLI has not changed illustrates shortcomings of this organization (Warnholtz, 2015). The inexistence of interpreters in many of these languages (e.g. Yaqui, Tepehuano de Durango, Guarijío, Mayo or Seri) also suggests that the results of INALLI are still far from the objectives and goals outlined in the General Law of Linguistic Rights of the Indigenous Population (Desmet Argain, 2008, p. 114-115).

that, although the INALLI has done little to secure the survival of the indigenous languages, other initiatives, coming mainly from the indigenous and academic communities, have been more active[8]. The following section offers an overview of Mozilla Nativo, a project funded by the Mozilla foundation to guarantee that the indigenous communities will have access to Internet in their mother languages.

Mozilla Native: The Inclusion of Indigenous Languages in the Web[9]

Digital inclusion has been discussed for a few years now. The issue became particularly prominent in 2017 when the World Economic Forum released the white paper "Internet for All. An Investment Framework for Digital Adoption" (WEF). In a nutshell, the paper concludes that there is not a single solution that will fit all the communities and regions, the necessity of developing new business models that are not based on economic profit, this project neglects the linguistic diversity, the importance of taking into account the solutions that have been successful in other organization, and the need to "leverage technology expertise to compensate for regional lacking in local policies" (Digital Inclusion Newslog, 2017). Interestingly enough, Mozilla Foundation is mentioned as one of the companies that have promoted and funded the "locally-developed solutions for solving challenges such as last mile connectivity" (Digital Inclusion Newslog, 2017).

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[8] "Vamos a aprender Mixteco [Let's learn Mixteco]", an app developed by Donato García, and the Poetry Festival 'Languages of the Americas. Carlos Montemayor' created by the National Autonomous University of Mexico in 2004, are a few examples of these initiatives.

[9] According to *Lenguas indígenas*, a network of digital activists located in Latin America, a significant number of the 900 registered indigenous languages in Latin America is endangered.

Although having an adequate infrastructure is key to overcoming the digital divide[10], t there are other obstacles hindering the public and general use of Internet such as insufficient digital literacy and the limited number of languages in which digital content and software tools, programs and apps are available. In this regard, only the Mozilla Foundation[11], via the project called Mozilla Nativo[12], has actively been involved in the training of translators as well as in the actual translation projects of their software; a community of open code software developers also guarantees that it would be used in the mother tongue of the users. Mozilla Nativo was formally launched in 2014 to support the translation of their interface into indigenous languages. Nowadays, more than 50 translation projects are in progress in countries such as Bolivia, Colombia, Ecuador, El Salvador, Guatemala, Mexico, Peru. To date, Firefox is available in Guaraní and Maya Kaqchikel; Firefox Focus has been translated in Triqui (Oaxaca and Baja California), Zapotec (Oaxaca), P'urhépecha, Ixil (El Quiché), and Tzotzil (Chiapas) to mention but a few.

Participation in Mozilla Nativo contributes to the development of indigenous languages, as it favors the use of these languages outside everyday domestic contexts and into specialized ones. Software translation requires familiarity with operating systems, and with translation management tools. On the other hand, the

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[10] According UNESCO, an initiative launched by the Mozilla Foundation in 2017, there are 4 billion people who do not have access to Internet (UNESCO, 2019a).
[11] Mozilla Foundation was established in 2003 with the aim of developing free software to contribute to make Internet accessible and available to most people. 80 percent of internet users use only 10 languages (Nandwana, 2018); thus, there seems to be little motivation and even to make little sense to translate any digital product or content into one of the other 5990 languages that are currently spoken in the world (UNESCO, 2019b).
[12] In 2012, Google associated with linguists from the University of Hawaii at Manoa to develop and support the website for the Endangered Languages Project whose main goal is to offer "those who are interested in describing and strengthening these [endangered] languages a place to access information and to provide resources" (University of Hawaii, 2012).

implementation of the project also involves creating a work group, doing the translation, keeping constant with Mozilla drivers' team, launching the software, updating it and, in some occasions, accepting that some of the projects may not be uploaded or that they have a short shelf-life, thus they will be replaced as soon as the programs or the software tools become obsolete. For what regards to Mozilla Nativo, the technical issues are perhaps the easiest ones to solve since a member of Mozilla is actively involved throughout the translation process. More often than not, the real challenges emerge during the translation process itself as the translators' literacy as well as the development of specialized vocabulary in the target languages may be poor. The sheer inexistence of specialized dictionaries, translation tools and other translation resources should not go unnoticed. Other issues that may emerge during the translation process may be related with the lack of experience of the individuals involved in the translation project.

The next section offers an overview of the history of P'urhépecha language. This overview emphasizes how, in spite of the early publication of vocabularies and grammars as well as the somewhat frequent translation of literary texts from Spanish into P'urhépecha, the linguistic policies implemented by the Mexican State have failed to encourage the use of this language beyond the limits of the domestic space.

Early writings and linguistic policies in P'urhépecha[13]

P'urhépecha, the main indigenous language of the state of Michoacán, has approximatively 117,221 speakers, and thirteen dialects and variants (ELP, 2019). Other than a constant decline

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[13] Nowadays, the word 'indio' is considered to have a pejorative meaning. However, the official documents as well as the literature dealing with the native communities of the Americas at that time use this word. When possible, we have opted to use the word 'indigenous' as it does not necessarily allude to a colonial category (Bonfil Batalla, 1972).

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in the number of speakers, this status is unlikely to change as the communicative contexts where P'urhépecha is used as well as the resources to develop language technology are scarce. Although it has a writing tradition that goes back to the 16th century and it has been the object of linguistic research since the 19th[14], P'urhépecha has struggled to be used outside family and community circles and to consolidate as a written language in either scientific or literary texts. As indicated in the introduction, the 20th century witnessed the emergence and consolidation of the Mexican government's interest in indigenous issues. Implemented in the 1930s by the American linguist Mauricio [Morris] Swadesh, 'Proyecto Tarasco' could be considered as 'one of the first examples of the government and indigenous communities' efforts to encourage the literacy of the P'urhépecha in their native tongue[15]. However, the learning of P'urhépecha was but a mean to learn the official language as once the P'urhépechas had learned to read and write, everything else

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[14] The first written records of P'urhépecha date from the 16th century: Friar Maturino Gilberte wrote *Arte de lengua de Mechuacán* (1558), *Vocabulario en lengua de Mechuacan* (1559) and Friar Baptista de Lagunas authored *Arte y Dictionario: con otras obras, en lengua Mechuacana* (1574). According to Claudine Chamoreau (2009), the interest for the study of P'urhépecha gained momentum in the mid-19th century. During this period, a number of glossaries, vocabularies and grammars describing this language were published. American indigenous issues gained international relevance during the First International Teachers Convention hosted in Buenos Aires, when the delegated concluded that it was crucial "to incorporate the *indio* to modern culture" (Pineda, 2012, p. 15, our emphasis).

[15] The first stage of Proyecto Tarasco was implemented from July to August 1939 at Quinceo, Michoacán. According to Swadesh (1939, p. 223), "the procedure was very successful" and a large portion of the population of Quinceo learned to read and write. Maxwell Dwight Lathrop from the SIL also played an important role in this project. Swadesh project was preceded by that of Moisés Sáenz who established an "experimental station" in Carapan, Michoacán to study the "possibilities of incorporating the Mexican indigenous population to the rest of the Mexican society (Pineda, 2012, p. 16). Concluding that schooling alone was insufficient, Sáenz abandoned his project a year later. From 1942 to 1943, Sáenz was the president of the Inter-American Indigenist Institute, he was followed by Manuel Gamio (1942-1960).

was taught in Spanish (Chamoreau, 2009, p. 322). In the 1960s, the "Bilingual and Bicultural Plan" model, that included the teaching of P'urhépecha in primary and secondary school was implemented in the region. Although bilingual and bicultural in purpose, in reality, the plan continued to assign a secondary role to P'urhépecha. For example, *P'urhépecha jimpo* [In Pur'hépecha], the books to learn P'urhépecha, published and distributed since then among primary school students by the Ministry of Public education consist mainly of literary texts and of traditional local songs[16]. Additionally, P'urhépecha people only have an oral proficiency of their native tongue as the lack of a standardized writing system has hindered the development and availability of literacy learning materials.

The INI, the Popular Cultures General Direction and the Universidad Michoacana de San Nicolás Hidalgo created the Program for the Rescue of P'urhépecha Culture in 1979. In 1983, the program was renamed as Research and Study Center of P'urhépecha Culture. Since then, the Centre has conducted research in linguistics, traditional medicine and P'urhépecha Music. They promote P'urhépecha language via a number of publications mainly via the section called "Página P'urhépecha" which is included in the newspaper *La Voz de Michoacán*. INALLI (2019) publications also exhibit a similar bias as most of them consist of popular short stories for children.

The preservation and dissemination of P'urhépecha language and culture have also been supported by The Colegio de Michoacán mainly via the publication of the works of Friar Maturini Gilberti. Written in the mid-16th century, Gilberti's pages include translations to P'urhépecha of the Ancient Testament, as well as grammars and vocabularies that were the first volumes ever published in P'urhépecha[17]. These and other similar projects, e.g., the Cultural

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[16] More recent editions of these books include less literary contents and deal with environmental, general hygiene, scientific and technology topics.

[17] These volumes include *Arte de la lengua de Mechuacan* (1558), which was the first volume ever printed in P'urhépecha, *Thesoro spiritual en lengua de Mechuacan*, *Dialogo de doctrina Christiana en la lengua de Mechuacan* and *Vocabulario en lengua mechuacana* (1559).

Missions, Rural Schools and Bilingual and Bicultural Education have been key in the preservation of P'urhépecha language. The Universidad Intercultural Indígena de Michoacán [Intercultural Indigenous University of Michoacán, UIIM, Spanish acronym] was created in 2006 with the purpose of offering higher education in regions inhabited by indigenous population, and thus contributing to the revitalization and preservation of indigenous languages (González, 2016). In the following section we describe how certain members of the UIIM initiated the Mozilla Nativo in P'urhépecha project, thus contributing to the creation and consolidation of specialized knowledge concepts in P'urhépecha.

Mozilla in P'urhépecha

Translation has long been considered as effective tools to overcome the digital divide (Pym, 2004). However, in addition to costs and infrastructure deficiencies, these tasks are hindered because of the lack of trained translators in minoritized languages. To a large extent, the translation into and from languages other than Spanish in Mexico, is still performed by individuals who are proficient in their native tongue and in Spanish[18]. Translation in these languages is practically unknown. To address this neglect, researchers and lecturers of UIIM created the group "Translation of Computational Interfaces" in 2012. Along with students of the bachelor's degree in languages, the leaders of the group, Abraham Custodio Lucas, Mauricio González Avilés and Bulmaro González Ambrosio, began translating the word processor Abiword in P'urhépecha[19]. González Avilés also played a key role in the setting

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[18] Since its inception in 2003, the INALLI has been devoted to the preservation and development of the linguistic diversity of Mexico.

[19] The results of this translation are discussed by Zavala Ramos & Sebastián Valdez (2016). The code was translated but the compilation was not made because the group of Abiword never answered back. There were only two students involved in this project, it took them two years. Although the thesis is written in P'urhépecha

of the new translation project: he associated with José Flavio Sosa Gaspar, an engineering professor of the Instituto Tecnológico Superior [Technological Institute of Higher Education] of Tacámbaro-Michoacán. In turn, Sosa Gaspar organized a group of eight engineer students; he also contacted Mozilla Foundation to launch the translation of their software into P'urhépecha. Custodio Lucas and González Ambrosio were responsible for organizing 35 bachelor students of Language and Intercultural Communication program[20]. To cut in traveling expenses, the translation sessions were held once a month at the Centro de Desarrollo Profesional del Magisterio [Center for Teacher's Professional Development] of Morelia, 57 kilometers away, as the University did not have a computer lab nor access to Internet.

The students were divided in two main groups. The engineer students were responsible for registering the progress at Mozilla's platform, clarifying the technical concepts, providing training in the translation in digital environments and explaining the functioning of Internet search tools. The language students were in charge of translating the strings. The members of both groups registered and created a username at http://mozilla.locamotion.org. Once registered, the participants could access the "Terminology" file at http://mozilla.locamotion.org/tsz/firefox/translate/terminology. This file contains a total of 1003 terms, which have been secured from Firefox's platform using Pootle, an online translation tool and free software platform[21]. The translation of these terms required a significant effort to understand the central concepts and the way that it is used in online searching. In this stage, the use of monolingual dictionaries in English was key, as it helped the translators to understand the meaning of the concepts and to look for a way to

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the title is in Spanish. It is the first thesis to be written fully in P'urhépecha. Although other theses have been since then written in P'urhépecha, most of them are still written in Spanish.

[20] Unfortunately, as the semester progressed, the number of translators diminished because the students were busier with their courses.

[21] For the full list of the translated terms see González Ambrosio (2018).

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express it in P'urhépecha. All the translators had an individual folder to upload their work. This turned to be problematic as the written form of P'urhépecha has not been standardized yet. In consequence, the members of the translation team wrote their translation solutions according to their own personal convictions and educational background[22]. Another issue was that a data base with the common terms was not created, thus leading to a lack of unification regarding the writing as well as the translation. The translation was revised by the team leaders to unify the writing as well as the translations, and to clarify those concepts that were difficult to understand.

By early 2016 the group managed to translate almost 90 percent of the strings or character sequences that constitute the text of the platform[23]. Once the translation team considered that the project was finished, a Mozilla drivers team uploaded the translated version. This was followed by a promotion campaign to disseminate and encourage the use of the new version among P'urhépecha speakers. However, neither the translation team nor the Mozilla Foundation have means to keep track of the actual use of the new version. Informal surveys conducted by the translation group leaders amongst the students of UIIM suggest that most of them use either the Spanish or the English version of Mozilla's searcher.

Concluding remarks

Although linguistic policies in Mexico have come a long way, and the aspiration of a monolingual state has been replaced by a

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[22] A positive outcome of this issue was that translators as well as the project leaders became aware of the significance of having a standardized writing system.
[23] The significant advance in the project allowed them to participate in the 2016 Hackathon held at Oaxaca (to attend the event, translation projects must have a progress of 80 percent). Prior to the Hackaton, delegates must set clear objectives and achievable goals. In a few words, the Hackaton enables people for different translation projects to meet face-to-face and to exchange experiences, issues and solutions.

growing recognition of the multilingual nature of the population, current linguistic policies still consider Spanish as Mexico's official language. Consequently, equity between this and the other languages spoken in the territory remains an unattained goal. Overall, these policies have mainly addressed to encourage bilingualism in indigenous communities mainly via the creation of bicultural universities and learning institutions, the training of bilingual teachers as well as of the production and dissemination of bilingual publications.

However, as illustrated in this article, these actions have fallen rather short for what concerns the learning of indigenous languages as well as their use outside community or family circles. To some extent, these shortcomings have been the result of limited learning resources and of a certain skepticism and long-term held prejudices against the capacity of these languages to maintain currency and to keep up with digital revolution and its demands for the creation of new vocabulary, text genres and composition styles. Mozilla Nativo in P'urhépecha, and the other projects leading to the translation of this software into indigenous languages, has proved these prejudices wrong; as least for what regards the linguistic possibilities of this language to create new vocabulary able to respond the pressing demands of the changing digital landscape. Nonetheless, once translated, P'urhépecha speakers have been reluctant to use the P'urhépecha version of Mozilla, and still prefer either the Spanish or the English version.

In any case, Mozilla Nativo has indeed materially and symbolically enabled the translation of traditionally minoritized and endangered languages thus contributing to visibilization of the adverse conditions these languages and their speakers endure as well as to the need to create suitable materials for language learning and to train individuals to teach and translate these languages. Particularly, Mozilla P'urhépecha highlights the pressing need to develop an effective strategy to encourage the adoption of this and other digital, scientific and cultural goods that are translated and/ or produced in P'urhépecha and in other endangered languages.

Finally, the activist and agency potential of translating digital technologies into endangered languages should not be go unnoticed. In the case studied here, this potential is threefold. Firstly, this type of projects brings together communities whose languages are threatened thus enabling the possibility of sharing successful and unsuccessful translation and teamwork strategies. Secondly, these initiatives enable the emergence and consolidation of translation networks of individuals that would otherwise be unthinkable due to the linguistic and geographic distance as well as to the unlikeness for these languages to translate or to be translated. Thirdly, Mozilla Nativo in P'urhépecha highlights the advantages of including other types of actors aside the local governments and of involving the target communities in every step of the process; ultimately, this as well as the other projects launched under the Mozilla Nativo scheme have been initiated by the communities themselves.

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