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TAKING OPEN-SOURCE SOFTWARE TO GRASSROOTS LEVELS THROUGH LANGUAGE LOCALISATION USING OPEN TOOLS AND PLATFORMS: A CASE OF QGIS DESKTOP SOFTWARE TRANSLATED IN HINDI

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Abstract: *language location of open-source software tools without the need for any programming or typing knowledge, using transliteration tools and open supporting tools and platforms, is the need of the hour, to take the software tools to the grassroots levels. The Hindi localisation of the Graphic User Interface (GUI) of QGIS software started in this direction. The master tutorials and websites can also be localised. Initially, translations were done in the standalone utility of Open-Source Qt Linguist, and later, localisation work of the QGIS project shifted to the online Transifex platform, which is a cloud-based localisation platform that enables continuous translations of digital products and their related support contents. Transifex gives open-source projects free access to the platform. The online and continuous translation is better for dynamic projects where the release cycle is faster and words and string counts increase with every new release, as in the case of QGIS. In the QGIS desktop project, translation was started with the version QGIS-2.8; there were 76289 words and 13526 strings to be translated. Out of those, 40532 words and 11855 strings were translated. Later, the newer software versions increased the number of strings/words. Currently, the QGIS Desktop project has 113 languages under the Transifex platform, open to be translated by any willing community member from anywhere around the world using simple transliteration tools like Google Input Tools. A total of 175466 words and 33922 strings are there to translate. Out of that, 25.8 percent of words are translated, and 11.21 percent are reviewed. This paper describes the flow of language localisation work by a common man, taking the case of language localisation of the QGIS Desktop project in Hindi using standalone and online open support platforms. The challenges and issues related to language localisation are discussed in detail. Currently, the author is the coordinator in the QGIS Hindi Desktop project team on the Transifex platform, and 20 members have joined as translators, as shown on the Transifex website. This paper is intended to make the Open-Source Software users aware of the possibilities of their contribution to the wider use of tools by users of different languages at the grassroots levels.*

Key words: Localisation, QGIS, Hindi, Qt Linguist, Transifex, Open-Source GIS, FOSS4G

Introduction

Open-Source GIS technologies are becoming popular and widely used by governments, NGO, private institutions, firms, scholars, researchers, and faculty. As Open-Source GIS is now fully organised and well supported by reputed international organisations and universities, it can be a medium to put Geo-Informatics up to any level. Many Universities/organisations are supporting Free and Open-Source Software for GIS (FOSS4G). Out of these, the Open-Source Geospatial Foundation (OSGeo) is a leading international non-profit organisation that incubates a wide range of open-source web and desktop GIS software/utilities. OSGeo Foundation has a network of chapters and members from all over the world, and India has a chapter at IIIT, Hyderabad, and many charter members, including the author. QGIS is a user-friendly open-source geographic information system (GIS) licensed under the GNU General Public License. QGIS is an official project of the Open-Source Geospatial Foundation (OSGeo). It runs on Linux, Unix, macOS, and windows and supports numerous vector, raster, and database formats and functionalities. It can also integrate external software like R, SAGA GRASS, and others, enhancing its power for advanced users (QGIS Development Team, n.d.). Training and capacity building are essential for taking open-source GIS technologies to the grassroots level. To spread and make use of QGIS easily in the Indian community, translating the interface, website, and tutorials into local languages is necessary. OSGeo products and other standard open-source products have support for translating the interface, tutorials, and website into local/regional languages, with voluntary or institutional support. To date, officially, 113 Languages under the QGIS Desktop project, 58 languages under the QGIS Documentation project and 65 languages under the QGIS Website project are under translation.

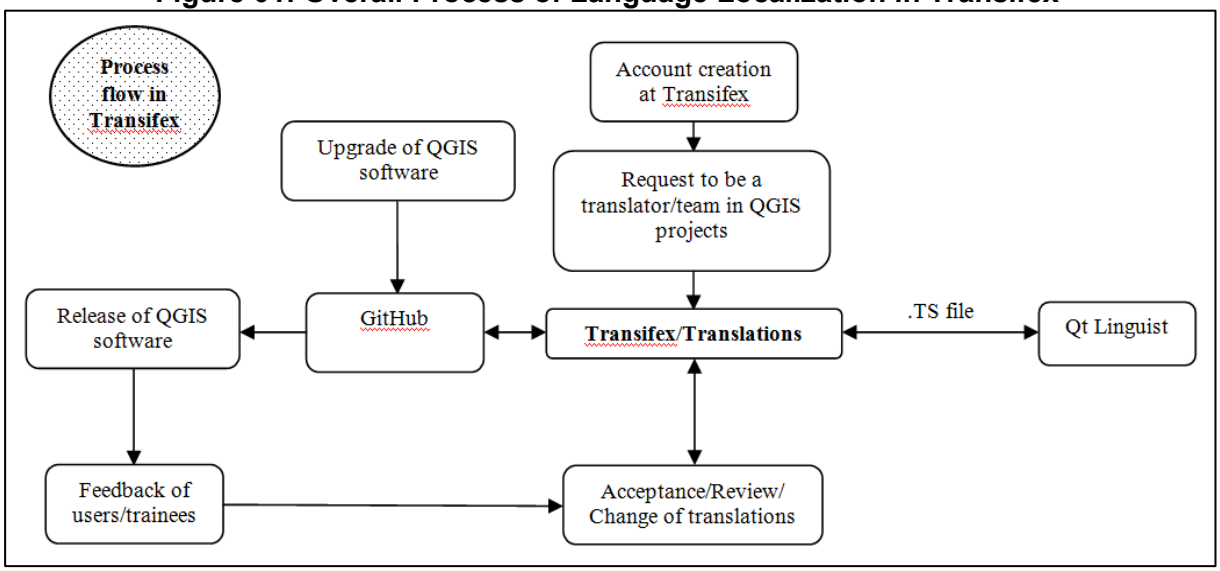
Process

At the initial stage, QGIS translations were being done using Open-Source Qt Linguist desktop software (an open-source utility for translations) in which a Translation Source (TS) file qgis_hi.ts used to be translated and the file was sent to language administrators, and they input this to new or weekly versions of QGIS. QGIS software has a standard translation source (TS) file for each language, which can be opened using the 'Qt Linguist' utility. A TS file for the Hindi language from language administrators was requested, and it was provided on GitHub (the open-source platform for all resources of QGIS). After downloading this raw TS file for Hindi from GitHub, translation work was initiated on this file with Qt Linguist software. Initially, the TS file for the Hindi language has 68883 words, 356326 characters, and 410511 characters (with spaces). Later, the localisation work of QGIS shifted to the online Transifex platform, which is in parallel to Qt Linguist. Transifex is a cloud-based localisation platform that enables continuous translation of digital products and their related support content. Transifex gives open-source projects free access to the platform. The online continuous translation is better than a static utility for dynamic projects where the release cycle is in weeks or months, as in the case of QGIS. In Transifex, work may be checked and reviewed anytime. As the responsibilities and password-protected accounts are separated in Transifex, translators and reviewers may work on different systems simultaneously and in various spaces. Presently, Transifex is the official sole platform for translation in all three projects of QGIS, namely QGIS Desktop, QGIS Documentation and QGIS website (Transifex QGIS translation project, n.d.). In Transifex, translations are suggested based on the previous translations and glossary (glossary can also be shared for multi-language translations). For translating any word for which translation has not been done previously or if the typist and author remain unable to recall the appropriate word from memory, appropriate translation for the word can be searched using online dictionaries on http://shabdkosh.com/, http://hinkhoj.com/ and https://translate.google.com/. To become a translator, a login ID must first be created on

Transifex. After login, the desired project may be searched in which a person wants to work. A request is to be sent to the project to become a translator, which language coordinators or administrators accept. After acceptance, a person can work voluntarily on that particular project. Tutorials and guides are available on the Transifex and QGIS websites for ready reference and help with translation procedures. 'Hindi Indic IME' utility, developed by CDAC and approved by the Government of India, is being used in the project to convert the keyboard from Unicode-supported 'Mangal' font to traditionally used Hindi fonts. Another excellent utility developed by Google, 'Google Input Tools,' was used by the author during checking and corrections, and interactive suggestions are displayed in Hindi on the go using transliteration. This utility is also available in many other Indian languages (*Google Input Tools*, n.d.).

The translations are included in QGIS software from Transifex by language administrators/maintainers and made available to the users in weekly releases and stable releases from time to time. Alternatively, the latest qgis_hi.ts file is available to the user. In that case, it can be released as qgis_hi.qm in Qt Linguist software. After the new translations, the author and the coordinator checked every translation and corrected spelling, general terminology, and sentence syntax. After the corrections, the status of the strings is converted to 'reviewed' by the coordinator. The translator can only alter/change the strings further once the string status is converted again as un-reviewed by the reviewer/coordinator of the language. From time to time, a backup TS file is taken from Transifex and kept in the system and external drive so that any damage/collapse of the site or system can be safeguarded and, further, in case of non-availability of an internet connection, the downloaded .TS file can be used with standalone Qt Linguist software also. This file with translations can again be uploaded to Transifex when needed. A diagram expressing the flow of the translation process is shown in Figure 01.

Figure 01: Overall Process of Language Localization in Transifex



Any time a weekly software release is downloaded from http://qgis.org/downloads/weekly/, current stable releases of QGIS software may be downloaded from http://qgis.org/downloads. In QGIS software, the status of language translation may be viewed from the Help menu>About>Translators section. In QGIS, Hindi language or any other translated language may be activated by taking the option for the language from the Settings menu >Options>Locale section>Override system locale>Scroll to your desired language>OK. A QGIS restart is required to activate the language change. Next time, the chosen language will be seen at every instance of QGIS till the language is changed

again in the same manner. All these efforts were done in older versions; hence, the process of activating things may vary in new interfaces. However, the translations remain unchanged in the latest versions. With every new version, as the number of words and strings keeps increasing, if continuous efforts for translations are not made, the overall translation percentage decreases with the same number of translated words. There were 76289 words and 13526 strings to be translated with version QGIS-2.8; out of those, 40532 words and 11855 strings had been translated under the QGIS Desktop project. Currently, in the latest version of QGIS 3.34, the number of strings/words increased in the QGIS Desktop application, a total of 175466 words, and a total of 33922 strings; out of that, 25.8 percent of words are shown translated, and 11.21 percent are reviewed (Transifex QGIS translation project, n.d.). The entire translation process of QGIS can be viewed in the respective documentation section of QGIS (*Translation Guidelines — QGIS Documentation*, n.d.).

Challenges

Many challenges were observed during the process, as language localisation is more than just a translation activity. It involves a comprehensive study of the target culture and correctly adapts the product to local needs. Hence, the user community's appropriateness and acceptance of words are more important than the purity of words. Even languages that are very close to each other have subtle syntactical differences. Some words are to be written as they are established in Hindi. Moreover, English has sentence syntax as Subject-Verb-Object, while Hindi has syntax as Subject-Object-Verb. The exact sequence of words may be translated differently into different languages with different punctuation. Some of the general constraints faced during the project are as follows;

- Appropriateness and acceptance of words in the user community, which is more important than the purity of words
- The ever-increasing number of words and strings with increasing size and functionalities of software.
- In the process, the translator should have command over both languages. Otherwise, the efforts will be almost doubled, and the language coordinator/reviewer at the next level will have to rewrite the words/strings again.
- QGIS is a volunteer-driven project and a collaborative effort; no institute/person involved can be entirely credited for the work, and anyone is free to join/leave the job at any time. This fact can be a constraint in getting institutional support.

Sustainability And Expansion of Work

“The Internet, new technology, machine translation and the emergence of a worldwide, multi-million-dollar translation industry have dramatically altered the complex relationship between translators, language and power” (Cronin, 2013). As translations will always increase with the increase in size and functionality of the software, voluntary translators will be encouraged to join the translation further. Matching the pace of translations with software development will be challenging. The glossary and translations can be kept on a portal like OSGeo India to find alternative, suitable words and suggestions from the larger community. The QGIS Master Document and Website need to be translated further for completeness and synchronisation of all components of the QGIS project. Later, the work may be extended to translating QGIS into other major languages in India, like Tamil, Telugu, Malayalam, Marathi, and others. Technology Development for Indian Languages (TDIL), CDAC from the Government, and NGO/organisations like Google and Microsoft Bhasha are developing language products and technologies. Department of Information Technology, Government of India, launched another major initiative called the National Rollout Plan to aggregate these software tools and to make them available through a web-based Indian Language Data Centre (ILDC). This activity is being executed closely with CDAC, GIST, and Pune. Under this, user-friendly software tools and fonts are being made free through language CD and web downloads for the benefit of the

masses. They have translated versions of Windows, LINUX Operating systems, and the LibreOffice suite in Hindi under the name Bharatiya Libre Office. To assist typing in all major Indian languages a 'Unicode Typing Tool' has also been developed by CDAC.

Conclusion

Translation or language localisation of any open-source tools is necessary to take the tools and technology to the grassroots levels and the broad masses. Commercial products mostly have funds obtained from expert organisations. Open-source tools depend on the help of voluntary support from users and supporting organisations. Open-source projects require more organisational and voluntary support to keep open-source technologies within the reach of wider users worldwide. With the supporting standalone open tools like Qt Linguist and open online platforms like Transifex, using transliteration tools developed by Google and the Indian Government, anyone can contribute to the language localisation of open-source software and tools. The Government should pick up the best and most authentic, widely used, open-source software and tools in various categories and provide some official and formal support from the public money to their development teams to customise and develop software further and localise it in multiple major Indian languages for widespread use of software at the grassroots levels.

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