ISSN No. 0976-5697

Volume 11, Special Issue I, May 2020

International Journal of Advanced Research in Computer Science

CONFERENCE PAPER

Available Online at www.ijarcs.info

COMPARISON BETWEEN LEADING APIS USED IN TRANSLATION APPS

Rashmi C
School of Computing & Information Technology
REVA University
rashmi.c@reva.edu.in

Neha Ann John
School of Computing & Information Technology
REVA University
nehasinger2010@gmail.com

Meenal Choudhary
School of Computing & Information Technology
REVA University
meenaltinu@gmail.com

Minu Devraj
School of Computing & Information Technology
REVA University
minudevaraj@gmail.com

Abstract—Translator Apps for Mobile devices is a mobile application to translate from English to Kannada (Language spoken in Karnataka) and vice versa. In addition translations can be done between other languages as well. And hence, APIs become an important part of the application. There are a lot of different APIs which can be used to perform translations. This paper presents a comparison between the most frequently used API by checking their accuracy, ease of use and other attributes to highlight which API is best used for Translation purposes.

Keywords—Mobile Application, Language Translators, APIs

I. INTRODUCTION

Language is a system of communication that enables humans to exchange verbal to symbolic utterances. It is the ability to acquire and use complex system of communication, specifically human ability. Estimated numbers of languages in world vary between 5000 and 7000.[1]

The number of mobile users have increased over the past decade worldwide and mobile applications are rapidly developing and have become a prominent segment of the mobile technology. As tourists travel around or people migrate to different countries/states, they face communication problems as they don't speak the local dialect. [3]

The consequences of inability to understand the language results in tourists unable to blend well with the culture and traditions as well as receiving wrong information. For mobile applications, APIs are used,

Where in the commodity functionality of the application is outsourced to the API being used. So, therefore, the developer doesn't have to write all the code from scratch and focus on the unique proposition of their application.

An API defines functionalities that are independent of their respective implementations, which allows those implementations and definitions to vary without compromising each other. So therefore, a good API makes it easier to develop a program by providing the building blocks.

There are different APIs that can be used when creating the mobile language translator application. The best and most frequently used API.[5]

1. Google Translate API
2. Microsoft Translation API
3. Systran.io Translation API
4. MyMemory Translation API
5. Yandex Translate API

II. LITERATURE SURVEY

In 1949, Warren Weaver described the possibility of using computer based machine translations to translate text between natural human languages.[18]

In 1954, The Georgetown – IBM experiment was the first public demonstration of a computer for translating languages using 250 words and 6 grammar rules.

In 1966, publication of the ALPAC report criticized Machine Translation methods because of poor quality and high costs.

In 1999, a Translation system allowing the Japanese to exchange conversations with foreign nationals through mobile phones was first developed by the Advanced Telecommunications Research Institute International-Interpreting Telecommunications Research Laboratories, based in Kansai city, Japan. As APIs were still not around yet, the high priced, and high efficient computer was inconvenient to carry around.

In 2005, Systran S.A, emerged as the market's leading developer of the most widely used language translation software, located in France. Systran.io is a collection of REST APIs, client libraries and samples for Text extraction, Translations and natural Language Processing. It enables you to utilize and analyze both structured and unstructured multilingual content such as user generated, social media and web content and more. As of today it allows more than 130 languages to translate between.[10]

In 2006 – Google translate API was one of the earliest APIs used for translations and now has more than 100 languages to translate between. And in 201g, its Neural Machine Translation was launched. It has over 500+ million people using it daily.

In 2006 – Machine translation which is achieved using Microsoft translator API focuses on eliminating language barriers and enabling global communication for written and spoken languages. It provides over 60 languages for translations. It's now used extensively within familiar Microsoft products such as Bing, Cortana, Microsoft Edge, Office, SharePoint, Skype, Yammer and Microsoft translator apps.[8]

After 2006's – The MyMemory translation API is a unique translation service. While the other popular APIs leverage machine learning, the MyMemory Memory translation API is based on the crowdsourced knowledge of thousands of human translators. It contains a repository of billions of words, translated by billions of professional translators thereby providing an expert system for language translations.[16]

In 2011 – Yandex translation API first appeared utilizing PROMPT (Russian company focused upon the development of machine translation systems) and was built into the Yandex browser itself. This is a REST API that allows translation between more than 90 languages.

III. OBJECTIVES

a) To compare the 5 leading APIs on the following attributes, as it will help bring out the key points of each API.

- Speed
- latency
- Accuracy
- Ease of Use
- Security
- Supported Languages
- Pricing
- API features
- File Size

b) Highlighting the better API based on the comparisons done.

IV. COMPARITIVE ANALYSIS

If an API is to be termed as good then, it should have high speed, low latency, good accuracy, easy to use, good security, cost effective. Even if most, if not all of these criteria are met the API will give fast and accurate translations.

The comparative information is shown in Table I:

TABLE I
COMPARITIVE ANALYSIS BETWEEN LEADING APIS

API	Google Translate	Microsoft Translation	Systran.io Translation	MyMemory Translation	Yandex Translation
SPEED (varies between language pairs)	418 ms	193 ms	Translates 10,000 words per minute with a Pentium processor	160 ms	355 ms
LATENCY	255ms	448ms	1041ms	1308ms	306ms
ACCURACY	• Decreases as sentence length increases • Text uses familiar or literary language • When used as dictionary to translate single words, as it must	• Can handle long sentences for translations. • Accurate translations as Microsoft	• Can combine deep learning capabilities with their existing vast amount of resources to	• Cannot accurately translate sentences containing slang, nuances and other culturally	• Provides accurate results even when the statement includes: Idioms, Formal Language, Grammar. • The hybrid

	guess between polysemic words (One word with multiple meanings). • Depends on the language pair.	chooses quality over quantity. • When searching for a single word then the API will generally return the most commonly used form of that word, ex: "apple" would be the company Apple.	provide an engine that is unsurpassed. • Systran linguists are continuously working to improve the output, making it more accurate and powerful. • As new languages are being added at a faster rate, accuracy is no longer the question.	relevant phrases. • Improves the quality of translations by scouring the web for bilingual documents. • Using a robust matching algorithm, this API provides accurate translation for your source text depending on the language pair.	machine translation system that combines neural and statistical approaches to machine translation to deliver our users an even higher quality translation that utilizes the complementary strengths of both translation models.
EASE OF USE	Easy	Easy	Easy	Easy	Easy
SECURITY	• Can be risky for companies dealing with confidential and secure information, especially when it comes to any type of legally sensitive material.	• As an Azure service, Microsoft Translator meets strict security requirements. Customer data submitted for translation by Microsoft Translator are not written to persistent storage. There will be no record of the submitted text in any Microsoft data center.	• Security is strict with this translation API. Everything is behind a firewall. • SYSTRAN provides defense and security organizations as well as leading global companies with the technology they need to listen, understand and react in 128 languages.	• MyMemory provides good security to its users as they don't share, sell or transfer 'Personal Data' to third parties without the consent of the user. • The API does not use 'Private Contributions' to provide translation memory matches to other MyMemory users and does not publish these contributions on MyMemory public archives.	• Can be risky while using to translate confidential information as while using the services, the user places user information in the service which can be accessed by Yandex and used to improve on quality. • AS API keys can be generated many times, and does not expire, could pose as a risk if the user does not place the key in secure location.
SUPPORTED LANGUAGES	More than 100	More than 60	More than 130	More than 80 (but some language combinations may not contain	More than 90

				any data)	
PRICING	Free for 50 requests per day, then $0.05 for each additional request	Free and varying paid plans from $25 to $200 per month	Free	Free and paid plans of $299 or $499 per month	Free
API FEATURES	• Translate text. • detect the source language	• Translate text. • detect the source language • transliterate words • bilingual dictionary capabilities • Natively Neural	• Translate text • detect the source language	• Search human or machine translations • insert translations	• Translate text • predictive typing • pronunciation and usage examples • dictionary with transcription
FILE SIZE	20.74 MB (Android) 70.9 MB (iOS)	65 MB (Android) 139.7 MB (iOS)	13.6 MB (Android) 34 MB (iOS)	1.6 MB (Android)	15 MB (Android) 123.5 MB (iOS)

V. CONCLUSION AND FUTURE ENHANCEMENT

From this comparative study we understand that there is a wide range of APIs to choose from when trying to build a translation app. These APIs help in performing the translation task easily without the developer wasting time in writing a separate code and reinventing the wheel.

Between these leading APIs used to build Translators, especially for handheld devices,

1. Google API even though widely used and appreciated, doesn't yet focus on the grammar of the sentence. It allows translation between 100 plus different languages and yet the accuracy of the translations depend upon the language pairs. It also has a low speed when compared to the other APIs. Security is also not looked after in this API.
2. Having a good response time during translation, Microsoft focuses on quality of their API and hence, have only 60 plus languages to translate between. Security is strict and Accuracy is good with this API.
3. Systran.io API proves to be good accuracy wise with a 99% success rate even though it has a problem recognising slangs, nuances and culturally relevant phrases and is also secure.
4. MyMemory has a higher speed compared to the other APIs but also has the highest latency among them. The accuracy is moderate with this API but the security is good. But even though it allows translations between 80 plus languages, some language combinations don't contain any training data.
5. Yandex API provides translations between 90 plus different languages and does the translations accurately. This API somewhat like Google API is not secure enough to be used for translating confidential documents.

Thus, as Yandex is a free API and has lesser latency than the other APIs and also provides accurate translation despite the complexity of the language pair, it is the ideal API that can be used for everyday Translations where security and confidentiality is not a primary concern.

If security and confidentiality is a concern then the ideal API to be used for translation would be Microsoft API as it is fast and accurate as well as secure.

If Microsoft API does not support the particular language being translated between as supports only 60 plus languages, Systran.io translation API can be used for translation as it is equally secure but latency wise better than MyMemory API.

REFERENCES

[1] Prachi Pise, Prof Sunita Deshmukh, "Implementation of Translation system using embedded platform,"2016 International conference on Automatic Control and Dynamic Optimization techniques(ICACDOT) International Institute of Information Technology (IIT), Pune
[2] Yang li, Takayuki Fujimoto, "A Concept of Multi-lingual Translation Application,"2018 7th International Congress on Advanced Applied Informatics
[3] Sim Liew Fong, Abdelrahman Osman Elfaki, Md Gapar, Md Johar, Kevin Loo Teow Aik, "Investigative Study towards the

Development of Mobile Language Translators," 2012 International Journal of Digital Content Technology and its Application
[4] https://rapidapi.com/collection/translation-apis
[5] https://blog.api.rakuten.net/top-10-best-translation-apis-google-translate-microsoft-translator-and-others/
[6] https://english.api.rakuten.net/googlecloud/api/google-translate1
[7] https://yandex.com/company/blog/one-model-is-better-than-two-yandex-translate-launches-a-hybrid-machine-translation-system/
[8] https://microsoft.com/en-us/research/group/machine-translation-group/
[9] Marcin Junczys-Dowmunt, "Microsoft Translator at WMT 2019: Towards Large-scale Document-level Neural Machine Translation"
[10] https://systransoft.com/systran/news-and-events/press-room/
[11] https://platform.systran.net/index
[12] Noa Talavan Zanon, "Evaluating the output quality of Machine Translation systems: Systran 4.0"2015
[13] https://analyticsprofile.com/machine-learning/best-language-translation-apis-available-2019/
[14] A.Barreiro, J.Monti, B.Orliac, S.preuB, K.Arrieta, W.ling, F.Batisa, I.Transcoso, "Linguistic Evaluation of Support Verb Construction by Openlogs and Google Translate"
[15] https://blog.weglot.com/fastest-translation-api-benchmark/
[16] https://programmableweb.com/api/mymemory
[17] https://blog.api.rakuten.net/mymemory-translation-api-tutorial/
[18] Maarten Van Hees, Paulina Kozlowska, Nana Tian, "Web-based Automatic Translation : the Yandex Translate API"
[19] Anh Tuan Nguyen, Peter C. Rigby, Thanh Van Nguyen, Mark Karanfil, Tien N. Nguyen, "Statistical Translation of English Texts to API code Templates"
[20] https://pairaphrase.com/best-translation-api-secure/
[21] https://microsoft.com/en-us/translator/buisness/translator-api/
[22] https://lifehacker.com/translation-tool-showdown-google-translate-vs-microso-1787836106
[23] https://speechtechmag.com/Articles/ReadArticle.aspx?ArticleID=110610
[24] https://blog.systransoft.com/launching-global-ready-start-ups-an-interview-with-start-up-mentor-ken-behan/#more-1098
[25] https://translationsoftware4u.com/enterprise-global.php
[26] Zehra BulBul, Fatma Buse Arici, Ayse Nur Cetinkaya, "Google Translate and Yandex Translate's Difference in Naturalness, Clarity and Accuracy : A Comparison Study on Machine Translations"
[27] Rodrigo Gomes de Oliveira, " Comparison of Systran and Google Translate for English -> Portuguese"2011
[28] https://blog.systransoft.com/systran-presents-its-latest-translation-engine-huge-quality-speed-improvement/
[29] https://rapidapi.com/blog/best-translation-sites/